THE Chemical Age

VOL. LXX 27 FEBRUARY 1954 No. 1807

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Volume LXX
Number 1807

The Chemical Age

Established 1919

The Weekly Journal of Chemical Engineering and Industrial Chemistry

BOUVERIE HOUSE · 154 FLEET STREET · LONDON · EC4

Telephone : CENTRAL 3212 (26 *lines*) *Telegrams :* ALLANGAS · FLEET · LONDON

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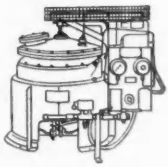

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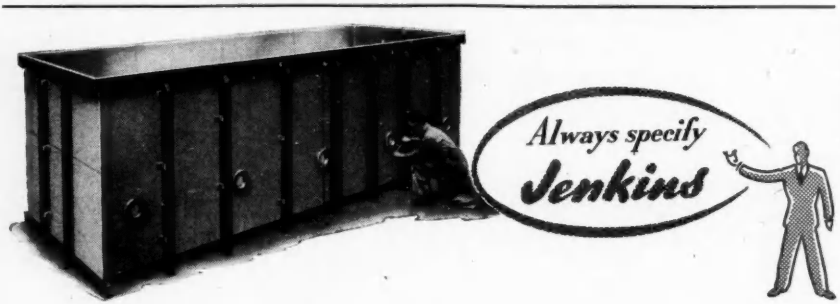

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Chemists & Administration

A FEW issues ago (see THE CHEMICAL AGE, 1954, **70**, 257-8) we discussed management. We have been prompted to discuss administration — which might perhaps be called the same thing in a higher state of purity—by the latest issue of the *Journal of The Royal Institute of Chemistry*, which contains two of the principal contributions to a symposium on the theme of chemists as administrators. Presumably it was thought worth while to devote a conference to this subject because there is a significant tendency for chemists to move from works or laboratory jobs into administrative positions. Mr. G. A. Campbell in his paper 'Industrial Administration' revealed that a study of the Royal Institute's Register showed that 8½ per cent of its members were actually occupying administrative posts. He regarded this figure as large rather than small because it was cited to show that chemists today did not lack opportunities to become administrators. But is a figure of 8½ per cent at all surprising? Chemists in many industries (if not in chemical industry itself where they are naturally more numerous) are in positions of not unprominent responsibility. Their reports on chemical matters must be considered by directors and managers, often with a good deal of personal contact. Any chemist with the flair for management or administration has favourable opportunities to display the sort of outlook that generally goes with it. With many companies today keenly aware that good administrative capacity is scarce, opportunity is naturally converted into actuality at a useful rate. We ourselves are surprised that as low a figure as 8½ per cent summarises the present state of affairs.

The capacity to administer large units of industrial organisation — and not merely to do so for a year or two but to go on doing it without losing zest—is to some extent a natural gift. One of the most able administrators of the gas industry some decades ago arose from the ranks of house-to-house meter-readers. For men in routine jobs like meter-reading the opportunity to show signs of greater talent comes perhaps once or twice in a lifetime, so the rate of conversion of meter-readers or desk-bound clerks into administrators is small and slow. The chemist, especially the only chemist or one of a few employed in a large business, is a luckier particle in the commercial Brownian movement that brings about collisions between VIPs and non-VIPs. Luckier is a word chosen with somewhat sordid bias. For it is one of the facts of life that administrative work is better paid than most other kinds of work.

There are a very large number of chemists and most mixtures of human qualities are to be found among them. There is no reason why a trained chemist should not also be skilled in other forms of activity. Is it too facetiously irrelevant to point out that we know chemists who are good tennis players, good golfers, and good amateur actors? The idea that chemists are only chemists and cannot be anything else is a foolish hangover from the era of under-recognition and inadequate pay.

It is also a by-product of the popular conception of any kind of scientist who carries out work in a laboratory, a mongrel fantasy owing parentage to professorial absent-mindedness, Teutonic zeal, and studious seclusion. There are a few chemists who still fit this bill but it is open to suspicion that some of the

examples have developed by deliberate pose rather than by natural evolution. At one time a firm employing a chemist expected to acquire an eccentric addition to the staff, and when it was not easy for chemists to get assured positions we can well believe that some chemists found it politic to come up to expectations. But all that is dead and gone. A meeting of chemists is not particularly distinguishable from any other meeting of £600-£2000 per annum workers.

The combination of inherent ability and opportunity makes administrators in industry and commerce. Training is certainly a third factor and the chemist's original training is useful for it should have brought the capacity to weigh facts without bias and it should have included the invaluable experience of self-discipline. The further training that is usually called experience, the years during which the skill attained is put to working purpose, is also likely to be contributory. The development of a new process or product, and even more emphatically the modernisation of an old one, brings the industrial chemists into close grips with a variety of administrative problems. During the years of business contract between the wars there was a notable increase in the executive powers of accountants. Costs had become matters of life and death for many companies, and the virtues of accountants suddenly rushed into everyday rather than annual prominence. It was a matter of frequency of opportunity. The last decade and a half has greatly increased the chemist's function in industry as a chemist and a similar frequency of opportunity has resulted.

In predominantly chemical organisations such as research stations or chemical businesses, it is normal for administrative posts to be filled by chemists. Possibly the percentage of imperfect administration in this class of chemist-administrators is higher than in other classes; certainly there are numerous cases in the past where administrative duty and separation from active laboratory work have been somewhat reluctantly accepted. If the first-class chemist could stick to his last without a sense of economic disadvantage, would he seek the promotion that the administrative post usually brings? Is it true that those who co-ordinate skill and effort are worth more than those who provide these qualities in their most specialised forms? But economic truth is not absolute truth and the argument can be left for the idealists; in practical terms it must be assumed that administrative skill is scarcer than chemical skill and is therefore more highly rewarded. If this is a correct assessment, then it also provides the answer to another question—is it wasteful for good chemists to forsake laboratories and become organisers?

To embroider this query of wastage, there seem to be two major aspects that cannot be ignored. The age at which the chemist is transformed into administrator is usually of a reasonably mature figure. There is a school of thought that supports the generalisation that a chemist's best work is done before he is 40, and allowing for the usual proportion of exceptions the generalisation is well evidenced. A working life that is predominantly 'chemical' up to 35-45 and more and more administrative in the years remaining may well represent the optimum utilisation of human capability. The second point is one of particularly current importance. Industry suffers far more from the inapplication of existing scientific knowledge than from any lack of such knowledge. As administrators play a large part in the formation of plans and policy, the actual application of chemical and other scientific possibilities is likely to be accelerated and not retarded by the transference of chemists from laboratories to committee-tables and board-rooms. The point at which acceleration dwindles and retarding commences is certainly not within sight at a mere 8¼ per cent. There is certainly no problem of ethics or national resources to be considered. The chemist who is as much blessed with administrative potentialities as the accountant or sales manager may well be more successful for that single reason.

Inasmuch as they are needed and deemed to be suitable, chemists will continue to turn into administrators. The pre-fabrication of administrators by special training may tend to reduce the opportunities in time, but the over-riding influence is the law of supply and demand.

Notes & Comments

Sources of Information

A REMARKABLY detailed study of scientists' methods of gathering information was published recently (S. Herner, *Industrial & Engineering Chemistry*, 1954, **46**, 228-36). A survey of 606 scientists, a planned sample of contemporary science both pure and applied, and including persons of widely varying age-groups, was conducted by interview. It is impossible in short space to summarise the results without incurring high risks of error and misinterpretation, and perhaps the most that should be said is that the paper will certainly rank as a classic contribution to this increasingly discussed subject of 20th century science. It should be studied in its full version by all who are concerned with organising scientific library and publishing facilities. One point that emerges is of topical interest in view of the recent passing of *British Abstracts*. Of the various sources of information used, abstracts ranked only fourth in frequency of employment. Personal recommendations, the regular reading of journals, and the consultation of cited references were all used to a greater degree than abstracts. As this is the result of a survey conducted in America, where *Chemical Abstracts* has been spared the financial torments and delays that our own abstract publication has had to suffer, it is all the more pointed a comment upon the relative importance of abstracts.

Cumbersome and Slow

IT is clear, too, from ancillary questions that were asked, that abstracting journals have declined in real value. Many of the scientists interviewed described these reference tools as 'too cumbersome and too slow to be used effectively.' The criticism about slowness is fortified by the fact that the journals most frequently consulted by 35 per cent of the scientists interviewed were less than one year old! In short the pace of modern science is faster than the possible pace of abstract publishing. The review paper by an expert, with its double function of critical assessment and literature surveying, is tending to displace abstracts; so, too, are reading lists issued by specialised libraries or research organisations. The citation of original papers in these publications is a preferable guide to the literature. That British scientists agree with their American colleagues we do not doubt. The demand for extra copies of THE CHEMICAL AGE annual review number and for reprints of the review type of article in our weekly issues convinces us that this is so.

Carbon Tetrachloride

A NEW use for carbon tetrachloride is foreshadowed in a recent letter to *Nature* (I. A. M. Cruickshank, 1954, **173**, 217). The writer, a research worker in the Plant Diseases Division of the New Zealand DSIR, presents convincing experimental evidence for carbon tetrachloride as a seed fungicide or disinfectant. Earlier work has shown that this chemical can effectively replace the hot-water treatment for seeds of peas and beans. The new experiments have extended the field of operation to linseed. Various combinations of time and temperature were tested for steeping the seed in carbon tetrachloride and germination was depressed only for the longer periods at 70° and 75°. But complete control over the two troublesome seed-borne diseases of linseed (*S. linorum* and 'browning' or *Polyspora lini*.) was obtained from the long treatments at 60° and short-time treatments at 70° and 75°. There is therefore a valuable margin of selectivity within which disease spores are killed but seed germination capacity is unaffected. For the time-temperature combinations that give disease control there is no significant absorption of carbon tetrachloride by the seeds themselves.

Possible Advantages

IT might be thought uneconomic to consider developing a chemical substance for seed treatment when hot-water steeping is already an established

practice. But the margin of safety with hot-water steeping is narrower so that in practical operation the hot-water method carries a bigger risk of germination damage. Also, the hot-water treatment has to be followed by artificial drying, and it should be simpler and cheaper to remove carbon tetrachloride vapour in a suitably designed seed-treatment plant. Although carbon tetrachloride is a substance of such versatile usefulness, its agricultural employment has so far been indirect rather than direct, principally as diluent for other volatile chemicals used in grain-store fumigation. Its own toxicity to insects has not been rated very highly. The new possibilities of using it for seed disinfection cannot be lightly discounted. Mercurial fungicides used as seed dressings have the disadvantage of toxicity, small enough when the seed is actually used for sowing but not by any means small when there is a chance that treated seed might change its market and be used for food extraction, e.g., oily seeds. Certainly with linseed it has long been recognised as difficult to ensure the adherence of powder-type dressings to the smooth seed coat, and heavier-than-usual rates of dressing have had to be given to obtain control. For that reason, no doubt, many seed producers have preferred the non-toxic hot-water treatment.

Metallurgical Coke

RECENTLY we drew attention to the gas industry's problem of coal supply (see THE CHEMICAL AGE, 1954, **70**, 359) and to current research efforts to utilise grades of coal formerly considered unsuitable. Exactly the same problem faces the metallurgical coke industry where the primary necessity is a coal that yields a hard coke with shatter test and Cochrane abrasion indices that do not fall below accepted minima. A paper read to the Institute of Fuel on 23 February reviews the progress made at the Fuel Research Station in fulfilling these requirements with blended coals. In Woodall-Duckham intermittent vertical chambers, already known to simulate coke-oven conditions with good reliability, it has been shown that up to 50 per cent of some non-suitable coal grades can be blended with the best Durham grades that are normally chosen without significant loss of metallurgical coke quality. Grades of coal considered far less suitable still can be used in a 20 to 25 per cent blend.

Need Imperative

THIS work is urgently valuable for the increasing requirements of iron and steel create an equivalently increasing demand for metallurgical coke. The use of coke in blast furnaces rose by 1,000,000 tons between 1951 and 1952, and it is estimated that metallurgical coke output must rise by 4,000,000 to 5,000,000 tons (or about 30 per cent) by 1960. This cannot be achieved when the coke-ovens are facing limitations of supply for suitable grades of coal. Blending must be introduced. Indeed, there is already some blending, about 10 per cent of the coal used in the ovens being of grades that would be unsuitable if used alone.

Will Aggravate Problem

UNLESS the conclusions we have drawn from the new paper are too hasty, the development of coal-blending for metallurgical coke production will aggravate the coal-gas industry's supply problem. The grades of coal that can be suitably introduced in coke-oven blends are grades that would be reasonably suitable for carbonisation in gas works. There must therefore be simultaneous development in the blended use of even less suitable grades for gas-making or the eventual result will be greater scarcity still of volatile coals. Our plea for a detailed national policy for coal utilisation is not reduced in necessity by technological advances.

Israeli Paint Oil Scheme

Because of the high price of paint base oil produced from locally-grown safflower plants, the scheme which was inaugurated two years ago is to be abandoned according to a statement by the Manufacturers' Association. Instead, the Israeli Golmei Zvaim company set up by the paint manufacturers to organise the domestic supply of base oil, a principal raw material, is negotiating with cereal growers for the planting of flax from which oil will be produced.

I.C.I. & Nationalisation

Commentary on Labour Party's Proposals

PROPOSALS for a substantial degree of public ownership of the chemical industry, published by the Labour Party in a pamphlet entitled 'Challenge to Britain' and formally adopted at the party's annual conference last year as part of its official programme, are the subject of a commentary prepared by Imperial Chemical Industries Ltd. 'for the information of its stockholders and employees.'

I.C.I.'s opposition to nationalisation was clearly stated in May, 1949, by the then chairman, Lord McGowan, and repeated by his successor, Mr. John Rogers, at the company's annual meeting in June, 1952. The present chairman, Dr. Alexander Fleck, reaffirms the assurances given by his predecessors in a foreword to the commentary, which has been published with the title 'The Chemical Industry and "Challenge to Britain".'

Dr. Fleck states that the board of I.C.I. remains convinced that the nationalisation or State ownership of the company would be against the long-term interests of the nation as a whole, as well as those of I.C.I., its employees and the customers who use its products.

Some of the main reasons underlying this belief are given by Dr. Fleck as follows:—

1. In a competitive industrial world, prompt decisions are essential to successful working. Nationalisation would slow down all major policy decisions.

Would Stifle Initiative

2. Nationalisation would tend to stifle commercial and technical initiative, and thus hamper the constant search for new products and processes, for more efficient methods of production and distribution, for more effective methods of management, and for new opportunities in overseas markets.

3. It is most unlikely that research work would continue to be so far-reaching and flexible, and at the same time so closely in touch with practical possibilities. Furthermore, there is the danger that short-term research would be favoured as compared with the long-term research on which ultimate progress so much depends.

4. The overseas interests of the company, which are largely dependent upon the good will and co-operation of the nationals of other countries, would be damaged. These interests include: (*a*) the company's world-wide export trade; (*b*) the development of manufacture overseas; (*c*) the management of those I.C.I. overseas companies in which local nationals are also shareholders and in which they are partly responsible for management; (*d*) technical co-operation with overseas firms, with a view to the exchange of patent rights and process knowledge. There is, moreover, a danger that decisions on overseas manufacture, hitherto based primarily on technical and commercial grounds, would be unduly influenced by political pressure from overseas governments.

Relations with Employees

5. The company's good relations with its employees, the conditions of employment, and its pension schemes could not continue to improve as they have done in the past.

6. It would be difficult for the company to maintain the present quality of its staff; some of the most promising potential recruits would hesitate to joint the company, a number of the most enterprising and active members of the present staff would be tempted to leave, while many of those who stayed would tend to be disheartened.

Dr. Fleck concludes by saying: 'Private enterprise has, I believe, enabled our organisation in the past to grow in a way which is vigorous, resilient, progressive and effective. It is my faith that the same private enterprise methods will enable us in the future to fulfil the demands made on us, and so make an ever-increasing contribution to the progress of industry in this country and thus to the welfare of all.'

The commentary reprints the two major references to the chemical industry in 'Challenge to Britain' and then examines those passages step by step.

In the following the quotations from the Labour Party pamphlet are given in italic type and are followed by abstracts from the commentary.

'*Chemicals are as vital to our economy as steel or coal.*'—Many other industries are vital. . . . The fact that an industry is

admittedly vital to the community is, however, no reason for nationalising it, until or unless it can be shown that this would improve its working. On the contrary, in the case of an efficient and complex industry, such as the chemical industry, there is every reason for not interfering with its work and progress.

'*The new economic plan will make fresh demands on the industry.*'—The advocates of nationalisation have always shown a predilection for 'economic planning' and have consistently ignored the difficulties of comprehensive planning in a society in which a substantial element of human freedom exists, and which is subject in large measure to international economic changes. There is no reason to suppose that any realistic economic plan has been worked out by them. Certainly there is no sign of it in 'Challenge to Britain' and the 'plan' amounts to no more than a series of aspirations, broad proposals and political beliefs.

Continuous Expansion

'*Chemical production must expand to keep pace with the enlarged requirements of other basic industries.*'—The history of the chemical industry is a record of continuous expansion. This expansion is still going on and the industry is confident that it will meet all the demands likely to be made on it.

So far as I.C.I. is concerned, there has been a very rapid expansion since the war, to keep pace with the needs of markets both at home and overseas. In the critical field of capital expenditure, the company spent over £146,000,000 in the nine years 1945-53. This sum relates only to capital expenditure in the UK. In addition, I.C.I. invested substantial amounts abroad through subsidiary and associated companies. Of the £146,000,000 total, £49,000,000 related to new products, including £12,000,000 for the initial stages of the fibre development programme.

The amount still to be spent to complete projects which are at present under construction is estimated at the substantial sum of £60,000,000, of which the development of fibres has a large share. The 1953 I.C.I. volume of production of chemical and other products (excluding those of the Metals Division) was approximately 80 per cent more than in 1946.

'*Increased production of food alone will require greatly increased production of fertilisers.*'—The current view, as expressed by the Ministries of Supply and Agriculture, is that UK agriculture will require 235,000 tons of fixed nitrogen in the present fertiliser year. Despite the enormous increase which has taken place in demand, from a pre-war consumption of 60,000 tons per annum of nitrogen, all home demands for nitrogenous fertilisers have been met from home production, and there has been a substantial additional quantity for export.

The nitrogen producers—nationalised and private alike—are fully alive to the situation; they are quite clear that a further increase in demand will occur only when the farming community is convinced that increased consumption is economic. Although in recent times demand has been stepped up, there is still some way to go before demand for further supplies outruns existing production capacity. This problem of further capacity is under continuous study by the company and in the meantime I.C.I. has offered, if necessary, to put at the disposal of the Government its experience in the operation of synthetic production units.

Current production of P_2O_5 is some 400,000 tons per annum and this will be adequate to meet agricultural demand in the present fertiliser year as estimated by the appropriate Ministries. Of this total, I.C.I. produces some 28,000 tons of P_2O_5 from phosphate rock and markets it in the form of Concentrated Complete Fertiliser, i.e., one containing the three essential plant foods. Two hundred and thirty-five thousand tons of the 400,000 are in the form of superphosphate, which is not made by I.C.I. although a subsidiary company, Scottish Agricultural Industries Ltd., manufactures 30,000 tons.

Exploitation of Potash Deposits

It is estimated that the UK agricultural demand for K_2O in the present fertiliser year will total 200,000 tons, the whole of which will be imported. Of this total, I.C.I. processes 33,000 tons of K_2O which, in association with the 28,000 tons of P_2O_5 mentioned above, appears on the market in the company's Concentrated Complete Fertiliser. Until the formidable problems associated with the exploitation of the deep-seated potash deposits in Yorkshire are solved, all UK potash requirements will have to be met by imports.

'*We must expand home chemical production wherever possible to replace imported chemicals.*'—Included in the chemical imports are many compounds which are in fact raw materials of the chemical, fertiliser and other industries in this country. . . . We have no home commercial source of the naturally-occurring compounds of potassium. Nor are there any domestic sources of arsenic, cobalt, radium, iodine, boron and many other chemical elements and virtually the whole of these have to be imported, as also have natural products such as various barks for tanning. These non-indigenous chemical raw materials form a substantial part of total chemical imports; potassium compounds alone amount to over £6,000,000.

In Britain we have no large resources of petroleum and natural gas similar to those in the USA. Since the war many products derived from these sources, and previously imported, have been replaced by home manufacture from imported oil. A petroleum chemicals industry has been set up to produce a wide range of organic chemicals. Carbon black, of which the USA was previously the main supplier, is now made here.

Minimum Imports the Aim

Several chemicals such as acetone, acetic anhydride and *iso*propyl alcohol, imported in substantial quantity even as recently as 1950, are now made in Britain in adequate quantity, and plants are being erected for many others. The industry is adding several hundreds of products to its selling range per annum, is very much alive to the desirability of keeping imports to a minimum, but recognises that certain products must be obtained from abroad if expansion into new fields is not to be delayed.

'*We must develop rapidly the new industries based on synthetic fibres and plastics which open up possibilities of large-scale replacement of traditional and costly raw material imports.*'—It must be pointed out that no new industries are based upon synthetic fibres. The chemical industry produces the fibre, or raw material, and the textile industry processes it. Neither industry is new.

Presumably, the authors mean that we ought to develop rapidly the new synthetic fibres and plastics. If that is so, the short answer is that the new synthetic fibres and plastics are already being rapidly developed, and that replacement of imports is not economically possible to any great extent.

'*At present, the chemical industry is under tight monopoly control.*'—There is no foundation in this assertion, although it is true that there is a monopoly in certain products. As far as I.C.I. is concerned, there is no truth in the implication that the company controls the chemical industry. In terms of labour, I.C.I. employs about one third of the workers in the industry, but it is only one of the 260 firms who are members of the Association of British Chemical Manufacturers.

Monopoly in Narrow Sense

I.C.I. manufactures some 4,000 separate products, not counting various grades of the same product. In some of these I.C.I. has a monopoly or near monopoly in the narrow sense, but quite often it is more apparent than real. . . . There are, indeed, very few I.C.I. products that are not subject to competition from identical products, from suitable alternative products, or from traditional natural materials. Further, there are many important chemicals that I.C.I. does not produce at all.

'*Final decisions in this vital industry are in the hands, not of the community, but of private individuals. This will not do.*'—The experience of the industries already nationalised refutes the argument that the accountability of the chemical industry would be improved by its being nationalised. The problem of accountability in nationalised industries has not been solved. In any case, a statutory monopoly, such as exists when an industry is nationalised, is protected from sanctions to a far greater degree than any private monopoly.

'*The Government will need to exert a positive influence over the size and shape of the industry's investment programme, and to integrate both with its general economic plan.*'—The suggestion glosses over obvious difficulties. If only part of the chemical industry were taken into public ownership the Government would not be able to decide the size and shape of the whole industry's investment programme, while any attempt to nationalise the whole industry would encounter a formidable task of definition.

'*To establish this positive control over the industry's investment programme, and to overcome the dangers inherent in private*

monopoly power, a substantial degree of public ownership is required. This will be achieved in such a way as not to disturb the smooth functioning of the industry at home and abroad.'—There are just as many, if not more, dangers inherent in statutory monopoly. . . . The position of the employee in a statutory monopoly is seriously affected, since there is only one employer in his industry. The statutory monopolies are able to tell the consumer to take it or leave it, and have in fact done so. There is no objective means of checking the efficiency of long-established statutory monopolies, except possibly by comparing them with the corresponding industries in other countries. Finally, the statutory monopolies are not subject to inquiry by the Monopolies Commission. . . .

Question of Goodwill

The statement shows no appreciation of the sensitivity of overseas markets to considerations of national sentiment and political persuasion. Is it likely, for instance, that the high measure of goodwill enjoyed by I.C.I. in such countries as Canada, the USA, South Africa, New Zealand and Australia would be continued in the event of the company being State-owned?

The matter, however, goes deeper than that. In some countries I.C.I. owns subsidiary manufacturing and trading companies, and it is often called upon to make decisions on whether to export to a given market or to undertake local manufacture. In other countries I.C.I. has partly-owned associated companies in which local nationals share in joint ownership and joint management and similar decisions have again to be made. If I.C.I. were to be nationalised that collaboration could not continue undisturbed.

So far as home operations are concerned, 'Challenge to Britain' shows insufficient realisation of the degree of inter-dependence and inter-relation between the various sections of the chemical and related industries. This is of particular importance because it raises insuperable obstacles to the nationalisation of some part of the chemical industry without causing confusion.

'*Our main concern is with the following sections of the industry: heavy chemicals; fertilisers; explosives; dyes and dyestuffs; plastics and petro-chemicals. But these chemicals are closely interconnected with other chemical products which, in many cases, cannot sensibly be detached. Final decisions as to the boundaries of public ownership must rest upon technical and administrative considerations.*'—The inquiry proposed to determine the sections of the industry to be taken into public ownership could have but one end. It would bring to light the immense complexity of the chemical industry and show the impossibility of drawing a clear-cut boundary line for nationalisation. Some arbitrary line could, of course, be drawn, but only by leaving a large part of the industry in private hands, or by bringing in a very wide range of products not contemplated in 'Challenge to Britain,' and not even in the chemical field, or by disrupting the industry in splitting off some of the activities of existing companies.

'*The final and most important link in this chain is to make sure that the investment is made in the industries that are vital to the fulfilment of our plan. We have to create an optimistic outlook in industry, for investment involves risk, and individuals and institutions are not always prepared to take these risks. No major problem arises in the publicly-owned sector, because urgent investment can be pushed ahead as a matter of Government policy. A Labour Government will certainly do this. Labour's proposals for public ownership in the chemical industry and in key machine tools and mining machinery concerns will help.*'—If, as implied, the development of I.C.I. and similar enterprises were made to fit into an ideological plan, and if priorities were determined by political considerations, the chemical industry and others, handled in this way, would suffer from the unwise direction of investment and the waste of resources in uneconomic schemes.

Sound Lines—Not Theories

I.C.I. under private enterprise will continue to be developed upon sound lines based on demand, and not upon theories. So long as I.C.I. and other chemical companies continue to be developed and managed along these lines, then, provided there are conditions in which savings can be made and soundly invested, the choice of priorities can safely be left to those in charge, and the industry will continue to be progressive as well as sound.

'Vest-Pocket Laboratory'

New Portable Organic Unit Virtually Complete

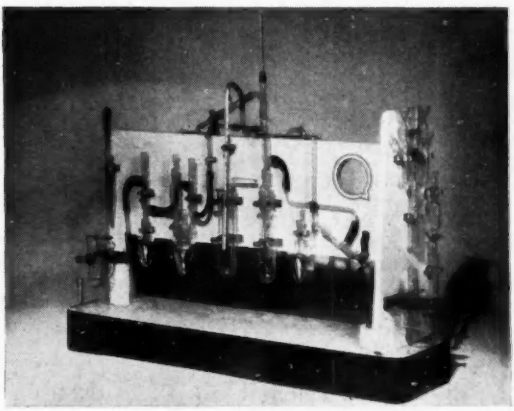
AN interesting demonstration was staged on Wednesday, 17 February, at the Norwood Technical Institute, London, when Dr. J. T. Stock, M.Sc., Ph.D., F.R.I.C., and Mr. M. A Fill, F.R.I.C., were in attendance to show a new semi-micro organic laboratory which is being manufactured by Quickfit & Quartz. This assembly is described as 'virtually a complete portable organic laboratory' and it was developed over a period of more than 20 years by Dr. Stock, who is vice-principal and head of the Chemistry and Biology Department at Norwood Technical College, and Mr. Fill.

A prototype of this unit was demonstrated by Dr. Stock and Mr. Fill at the International Congress on Analytical Chemistry held at Oxford in September, 1952, and aroused considerable interest both then and when photographs appeared in *The Journal of Chemical Education* (1953, **30**, 296) and *Mikrochimica Acta* (1953, **1-2**, 89). When a number of requests for units were received from overseas countries Dr. Stock and Mr. Fill sought the co-operation of Quickfit & Quartz Ltd., of Stone, Staffordshire, and this firm assisted in the design of a commercial model. Three of these were displayed last week and the company will shortly be placing them on the market. The unit weighs only 14 lb. and will sell for £32, or roughly one-third of the cost of a similar range of equipment on the normal scale. It makes use of 61 components from the extensive range of Q. & Q. interchangeable laboratory glassware.

Dr. Stock, who has had wide experience in these fields, believes that the new assembly will save time for lecturers and analysts, since it is ready assembled and does not need to be dismantled. In crowded laboratories the big saving in space needed to carry out experiments or demonstrations will be especially appreciated. Breakage costs will be minimised and training institutions will find that this will result in a considerable saving. The relatively small amounts of chemical substances (and hence heat) required for its operation will also appeal to educational authorities. Another advantage is that the small quantities of chemicals required will reduce the danger from accidents.

The semi-micro organic unit is mounted on a wooden stand, surfaced with Formica laminated plastic sheeting. The base of the assembly incorporates two drawers, inside which are test-tube racks for spare apparatus and thermometers. The handles by which the assembly is lifted are pierced to form additional test-tube racks.

The assembly was designed by Dr. Stock and Mr. Hill for use as a demonstration unit at the Technical Institute but is equally



Side I of the assembly, and the end panel, showing the remarkable compactness of design.

effective as a mobile laboratory for work in the field. Assemblies of this type for instance, could well be employed for such tasks as the determination of insecticides in orchards, hop gardens and on farms or for anti-gas work in the event of war. All the components on the assembly are fitted to the board by means of clips and are easily removable for cleaning or replacement.

The assembly, individual components of which fit together with the well-known Q. & Q. ground-glass spherical and conical joints, incorporates:—

On Side I:

1. Boiling water bath, with special 'ears' to support test tubes for evaporation and crystallisation;
2. Test pipette for dispensing reagents and for assisting the evaporation of solvents;
3. An ordinary reflux apparatus, with water condenser;
4. Three-neck reaction assembly, as used for Grignard reaction;
5. Melting-point apparatus with stirrer;
6. Continuous extractor for solids;
7. Distillation apparatus, with rotary fraction collector.

On Side II:

On this side of the assembly are pieces of apparatus for less common operations. They are:—

1. Steam distillation unit with special anti-suck-back device;
2. Fractional distillation unit with simple air-jacketed column, with fraction collectors mounted to slide to and fro;
3. Vacuum distillation unit, with three-way fraction collector.

On the end of the unit, connecting the two sides are:

1. Two Willstätter filters and a Schwinger filter (these filters can be raised into position when required);
2. Drying tube to fit the Schwinger filter and flasks;
3. Ice bath, with ears to support test tubes;
4. Separating funnel and drip tube;
5. Water inlet and outlet for the entire assembly.

Synthetic Fibres

Final Plans for Symposium

FINAL plans have now been made by the Plastics and Polymer Group of the Society of Chemical Industry for the symposium on 'The Chemistry and Physics of Synthetic Fibres' which is to be held on 24-26 March at the Institution of Electrical Engineers, Savoy Place, London, W.C.2.

The morning sessions will begin at 10 a.m. and the afternoon sessions at 2 p.m., and not as previously announced.

At the formal dinner arranged for 24 March at the Connaught Rooms, the guests will include Sir William and Lady Ogg, Mrs. Allison Settle and Dr. A. J. Turner, president of the Textile Institute. Mrs. Allison Settle will respond to the toast of 'The Guests.'

Several alterations have been made in the provisional programme (see THE CHEMICAL AGE, 1953, **69**, 969), mainly in the titles of papers. On the first morning Dr. R. Hill's general introduction to the symposium will be entitled 'Chemical and Physical Aspects of Fibres' and the title of Mr. J. W. Fisher's paper will be 'Polyaminotriazoles as Fibre Forming Materials.' An additional paper will be presented the first afternoon: 'The Free Energy of Formation of the Amide Bond in Polyamides,' by Dr. A. B. Meggy (Department of Textile Industries, Leeds University).

At the morning session on the second day, Dr. L. B. Morgan's paper will be entitled 'Crystallisation Phenomena in Fibre Forming Polymers.' The title of the paper to be presented in the afternoon by Mr. I. Marshall and Mr. A. B. Thompson will be 'The Drawing of Terylene' and this will be followed by a film on the same subject.

The paper to be given by Dr. A. R. Urquhart on the morning of the third day will be 'Cellulose Acetate as a Raw Material for Rayon Production' and an additional paper to be presented in the afternoon is 'Hydrogen Bonding in the Crystalline Regions of Cellulose,' by Dr. J. Mann and Dr. H. J. Marrinan (British Rayon Research Association).

Brazilian Ammonia Plant

The French company Batignolles Chatillon is supplying equipment valued at more than 1,000,000,000 francs for the installation of the greater part of a new Brazilian ammonia plant. Contracts for this work have already been signed, and negotiations are continuing for an additional 100,000,000 francs. Batignolles Chatillon is working in collaboration with several other French concerns, such as Air Liquide and Société Babcock et Wilcox.

BA-Shawinigan Petrochemicals Plant

Phenol and Acetone Production from Cumene

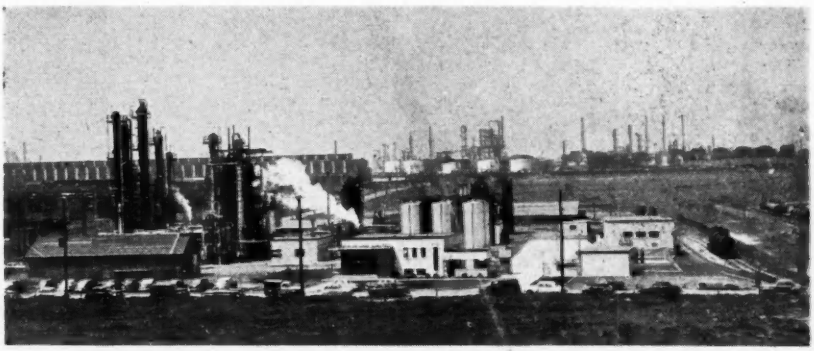
THE first large-scale plant in the world to produce phenol and acetone from petroleum by oxidation of cumene, operated by BA-Shawinigan Ltd. at Montreal East, Quebec, Canada (THE CHEMICAL AGE, 1953, **68**, 932) is now running satisfactorily. On reaching its production target of 13,000,000 lb. of phenol and 8,000,000 lb. of acetone per annum this installation will also account for nearly 1,000,000 lb. of α-methyl styrene.

Work on the oxidation of cumene to the hydroperoxide and the subsequent hydrolysis to phenol and acetone, was carried out in Germany by Hock and Lang up to 1944, but the yields obtained were very low, and the process was exceptionally slow. Further research was done by the Distillers Co. Ltd., in Britain, and by the Hercules Powder Co., in the USA, resulting in the development of a satisfactory commercial process. It is this Distillers-Hercules process that is used under licence at the $4,000,000 Montreal East plant.

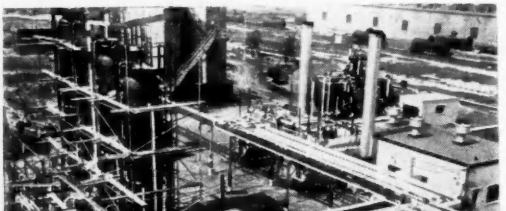
BA-Shawinigan Ltd. is a joint venture of British American Oil Co. Ltd., of Toronto, and Shawinigan Chemicals Ltd. (the latter a wholly-owned subsidiary of the $290,000,000 Shawingan Water and Power Co. for large-scale production of petrochemicals starting with phenol and acetone It may be recalled that during the first world war Shawinigan began manufacturing organic chemicals from acetylene derived from calcium carbide produced in electric furnaces at Shawinigan Falls. A comprehensive programme of research and development led to the introduction of a number of other products including acetone, acetylene black, acetic acid, acetic anhydride, ethyl alcohol, butyl alcohol, vinyl acetate and several vinyl resins.

Nearly all these chemicals can be produced from either acetylene derived from carbide, or from petroleum. For the past several years this company has been studying the comparative economics of production of organic chemicals, for example, acetones, from petroleum and from carbide. The process chosen for a given location obviously must depend upon the various factors of cost prevailing at the time. In Canada the natural development of cheap hydroelectric power in Quebec dictated until recently the manufacture of acetone from carbide.

The new petrochemical plant is sited near the Montreal East refinery of British American Oil Co. Ltd., and the cumene process for the production of phenol and acetone is peculiarly well suited to Canadian conditions. The domestic market for these products being relatively small, the conventional techniques for preparing acetone from propy-



General view of the phenol plant of BA-Shawinigan; in the background is the Montreal East refinery of the British American Oil Co., Ltd.



The plant area, showing four oxidisers in series, and part of the maze of piping

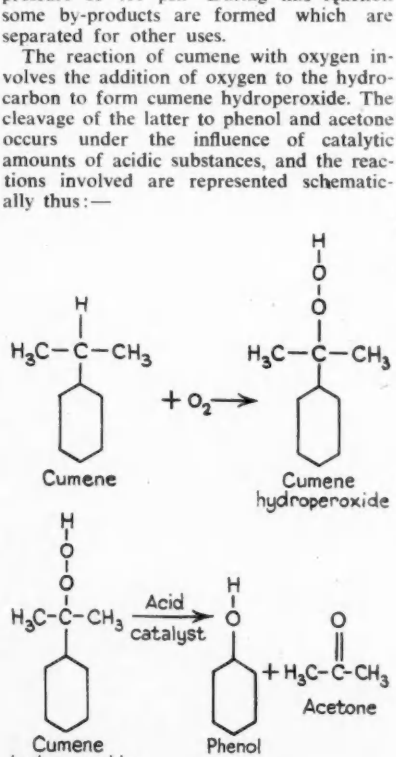
lene via *iso*propyl alcohol, and phenol from benzene by sulphonation and chlorination are not economical, due to high unit capital cost and the expense of operation on a small scale. By combining the two operations in one unit the new process offers the advantage of substantial economies and is eventually expected to prove of decided importance to the Canadian chemical industry.

Hitherto the latter obtained its requirements of phenol from the United States where its production was mainly by means of the sulphonation and chlorobenzene processes, depending upon either sulphuric acid or chlorine, in addition to benzene, as basic raw materials. The cumene process, on the other hand, calls for benzene, propylene and oxygen from the air as its principal raw materials, and by-product formation is less than that yielded by other processes where acetone is the main product.

The BA-Shawinigan plant covers four acres of a 21-acre site which will ultimately be needed for the production of other petrochemicals. Cumene is produced at the adjoining BA oil refinery in an installation specifically designed to manufacture a grade suitable for conversion into phenol and acetone. Since each lb. of phenol requires slightly less than 1½ lbs. of cumene only a moderately-sized installation was erected.

Propylene comes from the fractionation of refinery gases. The catalyst used for the propylene-benzene reaction is phosphoric acid supported on kieselguhr. A propane-propylene stream is freed from sulphur-bearing compounds and reacted with benzene at a temperature of 260° and at a pressure of 400 psi. During this reaction some by-products are formed which are separated for other uses.

The reaction of cumene with oxygen involves the addition of oxygen to the hydrocarbon to form cumene hydroperoxide. The cleavage of the latter to phenol and acetone occurs under the influence of catalytic amounts of acidic substances, and the reactions involved are represented schematically thus:—



The process operated by BA-Shawinigan involves oxidation of cumene with air in the presence of a suitable control material at moderately elevated temperatures. The conversion of the hydrocarbon may be limited to any desired degree, and the unchanged hydrocarbon recycled with the object of obtaining higher efficiencies and lower by-product formation. Only minor amounts of by-product dimethyl benzyl alcohol and acetophenone are formed. Under appropriate conditions cleavage of the cumene hydroperoxide may be made to occur almost to the exclusion of side reactions. It is conducted at slightly elevated temperatures employing an acidic catalyst. Dimethyl benzyl alcohol formed during the oxidation of cumene is converted to α-methyl styrene.

The crude mixture of phenol and acetone is separated into its components in suitably designed fractionation and purification units. Fractionation is carried out in a series of columns from 50 to 100 ft. high where acetone and unused cumene are separated. In the purification stage phenol is separated from a number of by-products including α-methyl styrene, acetophenone and mesityl oxide. The phenol and acetone are obtained in commercial purities complying with American Pharmacopœia and British Standard specifications. Careful control of both raw materials and reaction stages is maintained, to ensure that the quality of the finished products conforms to these rigid standards.

Because close control is necessary at all stages of the process the control laboratory at the plant is provided with the very latest equipment available, including ultra-violet and infra-red spectrophotometers to provide rapid analysis of intermediate materials and to determine the presence of the most minute amounts of substances not detectable by other methods.

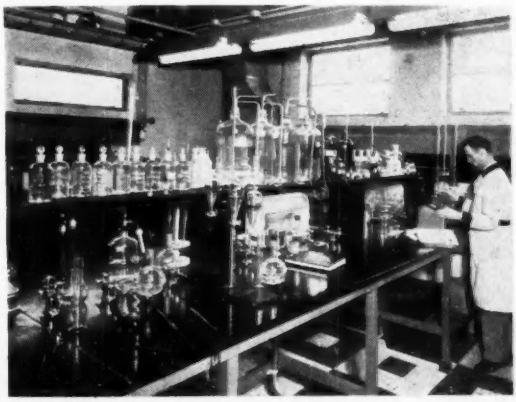
In short, compared with other established processes for the production of phenol, cumene shows distinct advantages with very few unfavourable characteristics. The process necessarily yields both phenol and acetone simultaneously and a suitable market is required for acetone to render the production of phenol attractive. Since these market factors exist in Canada the new process appears assured of a bright future.

The Canadian petrochemicals industry is indeed growing fast. The number of plants already in operation, or soon to go on stream, totals 24, accounting for an aggregate investment of nearly $216,000,000.

Anticipated output at Sarnia, Ontario, of carbon black is 20,000,000 lb., and doubling of this capacity is envisaged in the near future. This means about 30 to 60 per cent of Canadian requirements of carbon black imports will be met by home-produced material. Also, elemental sulphur recovered from natural gas now amounts to nearly 20,000 tons a year.

Here follows a list of Canadian petrochemical installations already on stream, or under construction:—

(See overleaf)



Part of the control laboratory. The assistant is performing an electrometric titration

Company, Location and Raw Material	*Major Products*
BA-Shawinigan Ltd. Montreal, Quebec. Propylene and benzene	Phenol and acetone, with acetophenone, mesityl oxide and α-methyl styrene as by-products
Bakelite (Canada) Ltd., Belliville, Ontario. Methanol	Formaldehyde for phenol-formaldehyde and urea-formaldehyde plastics
Cabot Carbon of Canada Ltd., Sarnia, Ontario. Oil fractions	Petroleum-type furnace black
Canadian Oil Company Ltd., Sarnia, Ontario. Refinery streams	Butylene
Consolidated Mining & Smelting Co., Turner Siding, Calgary, Alberta. Natural gas	Ammonia and ammonium nitrate
Dominion Tar and Chemical Co., Montreal, Quebec. Refinery gases	Ethylene oxide, ethylene glycol, higher glycols and detergents
Dow Chemical Co., Sarnia, Ontario. Refinery gases	Ethylene oxide, ethylene glycol, ethyl chloride, methyl and methylene chloride, styrene and polystyrene
Dow Chemical Co., Sarnia, Ontario. Styrene	Polystyrene
Imperial Oil Co. Ltd., Sarnia, Ontario. Refinery gases	Methane, ethane, ethylene, propane, propylene and butylene
Lubrizol of Canada Ltd., Niagara Falls, Ontario. Oil fractions	Lubricating oil additives
Monsanto (Canada) Ltd., Montreal, Quebec. Petroleum base stock	Polystyrene
Polymer Corporation, Sarnia, Ontario. Refinery streams	Styrene co-polymer and butyl rubbers, ethylene, *iso*butylene
Royalite Oil Company, Turner Valley, Ontario. H_2S from natural gas	Elemental sulphur
S. Nord Chemical Company, Petrolia, Ontario. Catalytic reformate	Benzene, toluene, xylene
St. Maurice Chemicals, Varennes, Quebec. Refinery gases, methanol and acetaldehyde	Formaldehyde and pentaerythritol
Shell Oil Company of Canada Ltd., Jumping Pond, Alberta. Sour natural gas	Elemental sulphur
Montreal, Quebec. Propane-propylene stream	*iso*Propyl alcohol and acetone
Sherritt-Gordon Mines, Fort Saskatchewan, Alberta. Natural gas	Ammonia
Vosco Industrial Chemical Products Ltd. Montreal, Quebec. Oil fractions	Dodecyl benzene and higher alcohols converted to synthetic detergents
***Canadian Chemical Co. Ltd.,** Edmonton, Alberta. Refinery streams	Pentaerythritol, methanol, propylene glycol, dipropylene glycol, *n*-propanol, *n*-propyl acetate, acetic acid, acetone, other alcohols, glycols, aldehydes, oxides, ketones and cellulose acetates
***Canadian Industries Ltd.,** Edmonton, Alberta. Ethylene by cracking natural gas	Polyethylene
Maitland, Ontario. Cyclohexane from imported base stock	Adipic acid and hexamethylenediamine (nylon salt and intermediates)
Calgary, Alberta. Natural gas	Ammonia
***Sun Oil Co.** Sarnia, Ontario. Refinery streams	Propane, propylene, *n*-butane, *iso*butane and *n*-butylene

* Under construction.

South African Newsletter

FROM OUR OWN CORRESPONDENT

CONSIDERABLE interest has been aroused by the statement of the chairman at the Associated Manganese meeting that the mineral rights acquired in the Postmasburg district include 'some of the richest iron ore deposits in the country.' Manganese and iron occur together over ground between Postmasburg and Sichen. It is in this latter northern portion of the field that the Iron and Steel Corporation plans to mine some 500,000 tons a year and the new railway line is in course of construction. The Sichen section should meet the Iscor demand for high-grade ore but the possibility of a further new area becoming available suggests that the Union might become an exporter of high-grade iron ore or even of steel. In this respect it is interesting to note that inquiries for iron ore have increased in recent months.

* * *

The Vereeniging works of Babcock and Wilcox of Africa (Pty.) Ltd. have been provided with a 400,000 volt X-ray unit for testing boiler-drum and pressure-vessel welds. The South African company reports that so far it has not accumulated any records, because it was not so long ago that production started at these works, but they have obtained a great deal of valuable technical data from the British works. A number of other firms in South Africa and various Government workshops are also using modern crack-detecting instruments. The Union Steel Corporation of S.A. Ltd. use a magnetic crack detection apparatus for the examination of surfaces of forged and rolled steel bars. They have two crack-detecting machines, one in the laboratory and the other in the works. A number of other South African firms are using similar equipment in their work and increasing interest in these appliances is evident in engineering, chemical and other industries.

* * *

The gold mining industry is the main source of uranium in Southern Africa, and through its milling capacity is likely to be so for a very long time. Nevertheless, the search for deposits of radio-active ores continues, particularly in Southern Rhodesia. Not so long ago encouraging indications were obtained in a preliminary survey of an area immediately north of Beit Bridge. African American Gold has acquired land in the area, and has just increased its capital to finance an intensive investigation. The Dalny Mine of the Falcon Mines group has also come into the news as a result of an inquiry into uranium possibilities. Some work has also been done on the Copperbelt in Northern Rhodesia.

According to official statements, radio-active minerals do exist in the copper-bearing formations, but as yet no indication has been given of their economic potentialities. The only company exploiting radioactive deposits in the Union, outside the Rand and Orange Free State, is that operating at Van Rhynsdorp in the Cape, where monazite is recovered. The Department of Mines states that minerals of this group exist over a fairly extensive portion of the Northern Cape and Namaqualand, including euxenite near the mouth of the Uranoop River, and at Kenhardt, where Vaalpark Townships are investigating the occurrence, having received permission to prospect from the Atomic Energy Board.

* * *

G. and W. Base Minerals, Wadeville, Johannesburg, are planning to erect modern preparation works, mills and offices on their five-acre site. They are to install the latest machinery for processing, mineral crushing and refining. Among the products to be handled in this new plant will be vermiculite, barytes, oxides, whiting, talcs, kaolin and a variety of clays for industrial purposes.

* * *

Derustit (Transvaal) Ltd., West Rand, Transvaal state that after a number of months of research and experimentation they can now offer industry a new process to remove mill scale from steel plates. It is expected that this method will be adopted generally in South African engineering practice, as it compares favourably with such methods as shot blasting and acid pickling. Briefly the method consists of generating large volumes of gas on the surface of the metal by electrolysis. The process is applied under careful controls to ensure

that the sound metal is not attacked. The pressure of the gas behind the scale particles thus operates as a powerful brushing action to force off the scale. A number of demonstrations have been made to interested engineers and others and the response has been most encouraging.

* * *

In regard to the non-ferrous requirements of the local building industry, copper is mined in the Union mainly in the Northern Transvaal and the North-Western Cape. No electrolytic copper is, however, yet produced in South Africa but fire-refined copper of exceptional purity, available from the Northern Transvaal, is used and blister copper is produced in the North-Western Cape. Few, if any, of the other non-ferrous metals used in building are at present obtained in the Union, and lead, zinc, aluminium, etc., are imported. Sheet copper and lead are not at present produced in South Africa, but a new plant is being erected in the Southern Transvaal which will be able to produce sheet copper. Sheet aluminium is being produced in Natal from imported ingots, but the bulk of this is finding its way into industrial uses not allied to building.

Expansion in Yugoslavia

THE Yugoslav chemical industry—other than that concerned with military requirements—will increase production by 20 per cent this year if the new General Development Plan is fulfilled.

The increased production will come mainly through new plants to be put into operation during the year. Among these will be a factory for nitrogen compounds in Lorazd, Eastern Bosnia; plants for caustic soda and chlorine in Lukavac, Bosnia; and a factory in Sabac, Serbia, which will produce 60,000 tons of superphosphates a year.

The plan also envisages the building of a viscose factory which, when in full production in 1956, will—among other things—produce 16,000 tons of artificial fibres. The construction of a factory for the manufacture of sulphuric acid and another for superphosphates in Prahovo, Serbia, will also begin this year.

Last year, the chemical industry in Yugoslavia increased its production by 13 per cent compared with the previous year.

Non-Ferrous Metals Market

ACCORDING to the British Bureau of Non-Ferrous Metal Statistics, the gross output of main copper and alloy products in the United Kingdom during the year ended 31 December last was 570,786 long tons, compared with 730,754 long tons during the previous year. Stocks at 31 December last comprised 18,098 long tons of blister copper and 37,246 long tons of refined copper.

Zinc consumption in all forms during the year ended 31 December last totalled 269,170 long tons, as against 255,657 long tons the previous year, and stocks of zinc in all grades at 31 December last totalled 27,652 long tons.

Total consumption of tin during the year ended 31 December last came to 18,634 long tons, in comparison with 22,554 long tons in 1952. Stock at 31 December last (excluding strategic stocks) totalled 3,085 long tons. Lead consumption during the year ended 31 December last is given as 303,753 long tons, stocks at 31 December being 21,762 long Structures.' by Mr. K. A. Spencer.

Visit to Shipyard

A VISIT to the shipyard of John Brown & Co. Ltd., Clydebank, will precede a joint meeting of the Corrosion Group and the Glasgow Section of the Society of Chemical Industry at Glasgow on 5 March.

The shipyard visit will be in the morning and the meetings will be held in the Royal Technical College, George Street, beginning at 2.30 p.m. Dr. Frank Rumford will preside and two papers will be presented—'Protective Coatings for Ships & Marine Installations,' by Dr. J. C. Hudson, and 'Cathodic Protection of Ships & Marine Structures.' by Mr. K. A. Spencer.

Under the chairmanship of Dr. J. C. Hudson, an evening session will begin at 7.15 p.m. Two further papers will be presented and discussed—'The Performance of Aluminium Alloys in Ships,' by Dr. D. C. G. Lees, and 'Corrosion of Ship's Machinery,' by Mr. L. Kenworthy.

South Indian Gypsum

The Indian Government have decided to permit export of gypsum of South Indian origin up to 3,000 tons on shipping bills until the end of March, 1954.

Methods of Chemical Analysis

Interesting Papers Presented at Bradford

A SYMPOSIUM on Methods of Chemical Analysis, at which Bradford Chemical Society acted as host to allied societies, was held on 13 February at Bradford Technical College. Opening the symposium, the chairman, Mr. H. Richardson, stressed the importance of the use by industrial chemists of methods developed in research laboratories. Papers fell into two categories. In the first, members of Research Associations presented methods which they had developed and in the second were methods, originally developed in research laboratories, which were used by industry.

Mr. G. A. Vaughan (Coal Tar Research Association) gave a paper on 'The Direct Determination of Oxygen in Organic Compounds.' This was based on pyrolysis in oxygen-free nitrogen, conversion of oxygen to CO and reaction of the CO with iodine pentoxide, liberating iodine, the factor being given by $5O = 2I$. The factor was increased by a step-up process involving solution of the iodine in NaOH solution, oxidation with bromine to give iodate and estimation of the iodine in the iodate—giving $5O = 12I$.

Mr. G. Wilman (Coal Tar Research Association) dealt with the use of infra-red spectroscopy in the estimation of tar bases such as pyridine, picolines and other substituted pyridines and described the calculations used in dealing with multi-component systems. Following discussion of his paper, Mr. Wilman outlined some of the qualitative information that could be obtained using infra-red spectroscopy.

Use of Radioactive Tracers

Two papers dealt with the use of radioactive tracers in chemical analysis. Mr. E. N. White (Coal Tar Research Association) outlined the method of isotopic dilution analysis in which a known amount of isotope is mixed with a sample of material containing the substance for analysis. A pure specimen of the substance whose content is required is isolated and the isotope content determined. If G_2 is the weight of substance in the sample, G_1 the weight of isotope of activity a_1 added, a_2 the activity of the isolated specimen, then equating:

$$G_1a_1 = (G_1 + G_2)\, a_2$$

and hence G_2 can be found. Mr. White described and demonstrated a scintillation counter, developed by the Chemical Research Laboratory, and there was considerable discussion of the advantages, disadvantages and applications of the method.

Dr. Robson (Wool Industries Research Association), described three methods involving radioactive tracers which could be used for amino-acid analysis. In the first of these cupric complexes of amino acids were formed, using radioactive copper, and the activity of the complexes estimated. Another method used the formation of compounds of amino acids with *p*-iodo-*p*-sulphonyl chloride containing radioactive iodine. Dr. Robson also discussed the isotope dilution method and means by which amino-acids in wool hydrolysates could be separated.

Mr. W. L. Thomas (Woolcombers Ltd., Bradford) gave a critical survey of *p*H measurement in relation to wool scouring. He discussed the estimation of the *p*H of scouring liquors and indicated some of the difficulties and complications. He pointed out that, in view of the lack of a generally accepted standard and the many variables involved, agreement on the desired alkalinity of an aqueous extract of wool, as obtained from *p*H, would be difficult to obtain. He mentioned the use of *p*H measurements in the treatment of effluents from wool scouring and the difficulties that might arise from absorption of grease and solids on the electrodes. Considerable discussion followed Mr. Thomas's paper.

Dr. G. F. Wood (Esholt Sewage Works, Bradford) described a method of estimation of ethyl ether in mixtures with petroleum ether. Effectively, this involved determination of the dielectric constant of the mixture by a resonance method and was capable of giving very accurate results. Dr. Wood demonstrated the apparatus described which was calibrated to read the percentage of ethyl ether directly.

An exhibition of chemical apparatus, including methods of detecting and estimating radioactivity, aroused great interest.

Improving Picture in Exports

Revised Classification of Board of Trade Figures

THE monthly 'Accounts Relating to Trade and Navigation of the United Kingdom' have taken on a new guise in 1954, and the improvement (in the chemical sections at least) is considerable. The classification now follows the Standard International Trade Classification of the United Nations, and the order and grouping of entries is fuller and more logical. The setting of the complete publication in a sanserif type also makes it easier to read.

During the month of January, the value of chemical exports from the United Kingdom showed an encouraging rise, both over December and over January 1953. Exports to India were nearly doubled, and good figures were also maintained in exports to Canada, South Africa, Australia, Eire and the Netherlands; Pakistan figures showed little change, and exports to the US continued to fall. The greatest proportionate rise (over 1200 per cent) is in exports to the Argentine. Totals for principal customers are given in the accompanying table.

TABLE 1
VALUES OF EXPORTS IN £ : CUSTOMERS

	Jan. 1954	Jan. 1953
Gold Coast	280,913	269,024
Nigeria	360,138	301,128
South Africa	828,570	836,443
India	1,242,446	695,279
Pakistan	374,310	410,524
Singapore	287,042	287,941
Malaya	275,817	237,318
Ceylon	216,064	408,688
Hong Kong	366,882	574,414
Australia	1,410,303	668,817
New Zealand	428,640	223,450
Canada	554,336	420,238
Eire	550,813	384,515
Finland	212,433	125,402
Sweden	447,428	397,220
Norway	207,423	307,550
Denmark	308,122	347,265
Western Germany	325,230	276,632
Netherlands	696,286	592,322
Belgium	367,654	291,865
France	422,287	508,103
Switzerland	218,912	112,896
Italy	400,841	293,296
Greece	202,006	72,258
Egypt	288,008	40,327
US	523,775	784,873
Argentine	536,617	44,348
Total value of exports	**16,355,795**	**14,237,480**

Copper sulphate shows a good improvement on December and the previous January; caustic soda is below the phenomenally high figures for December, and also below those for last January, no doubt because of the high December figures. Soda ash is down on December's value, but above January 1953; nitrogenous fertilisers show the expected seasonal rise, but are well below last year's figures, particularly in the ammonium compounds. Glycerin, although above December's figure, is well below the previous January, but solvents, other than the crude coal tar fractions, are up. Synthetic dyes, drugs and plastics have continued their rise. Below are summarised figures for the principal commodities.

TABLE 2
VALUES OF EXPORTS IN £ : COMMODITIES

	Jan. 1954	Dec. 1953	Jan. 1953
Acids, inorganic	53,221		52,812
Copper sulphate	492,067	50,653	434,495
Sodium hydroxide	386,023	401,442	472,386
Sodium carbonate	135,069	146,104	107,668
Aluminium sulphate	36,548	22,706	40,487
Bismuth compounds	39,868		27,280
Calcium compounds, inorganic	50,772		48,290
Magnesium compounds	64,781	74,070	39,369
Nickel salts	53,458	53,188	53,666
Potassium compounds, ex. fertilisers, bromides and iodides	44,285		18,486
Glycerine	67,037	47,771	189,364
Ethyl, methyl alcohol, etc.	170,507	—	72,783
Acetone	87,637	107,379	57,052
Lead tetra-ethyl	291,715	146,328	151,058
Total for chemical elements and compounds	**4,783,569**		**3,858,677**
Coal tar	59,642		29,329
Cresylic acid	35,986	71,208	73,730
Benzol	108	138,162	8,495
Creosote oil	154,490	202,954	260,596
Total from coal tar, etc.	**266,352**		**413,738**
Indigo, synthetic	84,037		79,454
Total for synthetic dyestuffs	**980,502**	**888,803**	**439,219**
Medicinal and pharmaceutical products, total	**2,825,718**		**2,403,302**
Essential oils—			
Natural	40,113	59,147	32,003
Synthetic	89,329		23,949
Flavouring essences, etc.	86,622		54,892
Total for essential oils and perfumes	**1,597,292**		**1,485,741**
Ammonium nitrate	84,734	59,626	116,754
Ammonium sulphate	318,859	373,112	985,757
Total for all fertilisers	**494,141**		**1,202,665**
Plastics materials, total	**1,941,748**		**1,423,623**

Spaces occur when comparable figures are not available.

Also given in the January issue are details of the value of goods liable to Key Industry Duty entered for home use during 1953, from which the following figures are taken:

	1951 £	1952 £	1953 £
Scientific glassware and lamp-blown ware, and laboratory porcelain ..	133,959	52,851	59,084
Metallic W and manufactured products, and compounds of Th, Ce, etc.	92,270	124,691	46,534
Mo and compounds, V and compounds ..	81,978	153,810	12,995
Ferro-titanium(<2% C), Mn(<1%C) and Cr metal	14,508	7,083	674
Synthetic organics, analytical reagents, etc. ..	5,103,479	3,182,072	6,040,927

Review of Chemical Prices

Changes in Annual Wholesale Averages

IN a review of UK wholesale prices in 1953, the *Board of Trade Journal* for 20 February states that between December, 1952, and December, 1953, prices of general chemicals rose, on average, by 3.6 per cent. Products which fell in price during the same period included: synthetic resins and plastic materials, by 3.8 per cent; drugs and pharmaceuticals, 3 per cent; dyes and dyestuffs, 0.9 per cent; soap, candles and glycerine, 6.1 per cent.

Among selected examples of changes in annual average wholesale prices are the following, the first price in each case being for 1952 and the second for 1953: sulphuric acid R.O.V. 94/95 per cent f.o.r. works, in road and rail tanks for minimum tank loads 5/6 tons, from £9.49 per ton to £9.39; penicillin crystalline 1 mega unit (vial size), from 2.78s. to 2.26s.; pure benzole BS. 135-1950 bulk minimum lots of 200 gal. delivered user, from 4.75s. per gal. to 5.05s.; cellulose acetate moulding powder (opaque), minimum half-ton lot, delivered price, from 4.34s. per lb. to 3.69s.; phenol-formaldehyde moulding powder, carriage paid buyer's address, in 56 lb. non-returnable bags, from 19.25d. per lb. to 19.2d.; polystyrene thermoplastic moulding powder crystal, carriage paid buyer's address UK, from 2.94s. per lb. to 2.83s.; urea formaldehyde moulding powder wood meal type, delivered user, unchanged at 1.29s. per lb.; cement, ordinary Portland delivered at London (Charing Cross) in non-returnable packages, minimum 6 ton loads, from 96.08s. per ton to 93.88s.

Price index numbers given for commodities and groups of commodities (30 June, 1949, = 100) include the following:—

	Annual Averages 1950	1951	1952	1953
General chemicals	109.2	124.4	138.0	142.7
Acetic acid, BS. 576—1950	102.9	166.1	178.0	138.1
Acetone, BS. 509—1950 ..	101.7	125.0	167.2	153.0
Aluminium sulphate (14 per cent Al_2O_3)	101.8	121.5	134.9	134.5
Barium carbonate, precipitated 98/99 per cent in powder form ..	105.9	120.3	137.6	137.6
Barium chloride, fine crystal	100.0	111.9	125.7	120.7
Benzole, pure, BS. 135—1950	118.0	137.7	162.9	173.2
Butanol, BS. 508—1950 ..	98.2	154.1	135.3	112.6
Calcium carbide, BS. 642—1951	87.1	90.3	94.0	108.3
Caustic soda liquor, 100° Tw.	111.6	117.5	127.0	137.3
Dichromate of potash ..	101.2	109.1	118.2	118.9
Hydrogen peroxide, 130 vol.	100.0	100.0	105.0	103.5
Liquid chlorine, pure ..	104.2	113.2	130.0	142.9
Methanol, refined ..	101.4	108.8	120.3	127.2
Nitric acid, concentrated, 85/96 per cent	102.9	114.1	124.6	129.1
Phenol	104.8	147.6	171.4	164.3
Phosphorus, 99.9 per cent pure, specific gravity, 1.82, melting point 44.1°	103.8	120.3	128.7	128.7
Phthalic anhydride ..	114.3	147.0	182.0	153.1
Pigments and earth colours, inorganic	103.6	120.9	125.7	119.2
Salicylic acid, technical or commercial grade ..	109.9	141.5	149.5	139.4
Soda ash, light (delivered)	114.2	122.6	131.2	141.4
Soda ash, light, f.o.r. works	114.8	122.1	132.6	147.2
Sodium cyanide, 96/98 per cent, standard quality ..	104.7	109.4	122.3	126.5
Sodium sulphide, solid, 60/62 per cent	108.5	116.7	131.2	135.5
Sulphuric acid, B.O.V. ..	1083.	135.1	147.7	146.3
Sulphuric acid, R.O.V., 94/95 per cent	110.9	149.0	170.3	168.4
Titanium dioxide, Anatase type	100.0	114.8	123.3	127.9
Titanium dioxide, Rutile type	100.0	114.2	121.9	125.0
Trichloroethylene, metal degreasing	102.1	110.9	132.0	137.7
Tri-cresyl phosphate ..	100.0	115.1	121.7	115.3
Urea, technically pure ..	101.5	113.6	121.9	131.9
Soap	99.2	108.0	115.8	109.3
Synthetic detergents ..	94.5	101.6	109.5	110.8
Glycerine	124.2	216.9	235.0	235.7
Dyes and dyestuffs	102.3	112.0	128.1	128.9
Disinfectants	100.7	105.5	110.3	108.8
Insecticides, weed-killers and fungicides	104.5	114.5	126.1	125.0
Synthetic resins and plastic materials	103.6	127.0	131.3	125.0
Cellulose acetate moulding powder (opaque) ..	97.1	141.4	126.6	107.9
Cellulose acetate sheet, commercial clear transparent	109.7	122.6	121.4	121.4
Laminated materials, fabric grade	110.7	158.7	168.2	140.3
Laminated materials, paper grade	101.1	137.0	146.5	134.1
Phenol-formaldehyde moulding powder ..	103.8	139.5	152.8	145.3
Polystyrene thermoplastic moulding powder ..	145.6	194.8	181.1	174.9
Polyvinyl chloride, Geon polymer 101	100.0	113.3	116.2	116.2
Polyvinyl chloride, H.O. ..	100.0	100.0	108.2	109.5
Urea-formaldehyde moulding powder	100.1	114.4	113.8	111.9
Salt	112.6	135.3	151.3	153.2
Hard coke	103.0	111.6	127.2	136.8

The Chemist's Bookshelf

THE VAN NOSTRAND CHEMISTS' DICTIONARY. Edited by J. M. Honig, M. B. Jacobs, S. Z. Lewin, W. R. Minrath and G. Murphy. Macmillan, London. 1954. Pp. 761. 60s.

It has been the sad experience of every chemist, many times in his career, to find that his reference books have failed him. A research paper has airily referred to a synthetic reaction, or an analytical test, by the names of its discoverers, and given no indication of its nature. The original reference is in some incomprehensible tongue in some inaccessible library, and the only hope lies in a dictionary or text-book. Almost invariably the reaction is so obscure or so untypical that no mention of it can be found.

A little book published some four years ago by the Society of Chemical Industry went some way towards improving the situation by listing about 500 organic reactions, and the present book, it is claimed, contains more than 5,000 proper-name entries, from the Abbe theory and the Abderhalden-Kautzsch test, to the Zsigmondy, Zulkowsky, and Zwikker reagents.

This is, on the whole, a very admirable dictionary, which does not, as so many dictionaries do, trespass into the territory of the text-book. There are, for instance, no long lists of chemical compounds—only elements, inorganic and organic ions and radicals, and organic types are listed. The proper-name entries, while not infallible, are more comprehensive than in any other book—but one major criticism must be made here. Since few details are given of the reagents or tests, it would have been very helpful (although it would have added about 50 pages to the volume) to have given one reference to an original paper in each case.

Naturally the editors have had their preferences, as is shown in the inclusion of an almost complete list of the terminology of the organic silicon and phosphorus compounds, and of a considerable amount of information on wave and quantum theory. But nothing irrelevant has been added, and at least one chemist will keep this volume close at hand when more abstruse research papers are to be read.—B.I.

THE EQUILIBRIUM PROPERTIES OF SOLUTIONS OF NON-ELECTROLYTES. Discussions of the Faraday Society. No. 15. Aberdeen University. 1953. 35s.

The first paper in this discussion is a memorable one. It is by Joel Hildebrand, and it is the verbatim report of his Spiers Memorial Lecture. It is called 'Models and Molecules,' and it puts the evolution of the theory of solutions into a perspective such as one would expect only from the greatest living authority on the subject. It surveys the solid ground and pin-points the problems that still remain. Some of these are at least partially solved in the subsequent papers of the discussion, which is divided into two sections—one theoretical and the other experimental.

In the first section a useful commentary on the general theory is given by Guggenheim. 'The Statistical Mechanical Theory of Molecular Distribution Functions in Liquids' is discussed by Kirkwood and Salsbury. Other important papers in this section are those of (i) Pople on 'The Statistical Mechanics of Systems with Non-central Force Fields'; (ii) Rowlinson on 'Lattice Theories of Liquids and Solutions at Low Temperatures'; (iii) Longuet-Higgins on 'A New Statistical Theory of Solutions of Chain Molecules'; (iv) Prigogine and Bellemans on 'Statistical Thermodynamics of r-mers and r-mer Solutions.'

The experimental section is introduced by Everett and important advances in particular aspects are reported in the fifteen papers in this section. Included among the authors are Moelwyn-Hughes, Wynne-Jones, Timmermans, Koefod, Rice, Schneider, Everett and Lambert.

The entire discussion bears the stamp of the authority one expects.—H. MACKLE.

HOME

Chemical Fellowships

Applications for two Ramsay Memorial Fellowships for advanced students of chemistry will be considered by the trustees in June. One of the Fellowships will be limited to candidates educated in Glasgow, who can apply to be considered for either Fellowship. The value of each Fellowship will be £400 per annum, to which may be added a grant for expenses of research not exceeding £100 per annum. The Fellowships will normally be tenable for two years. Full particulars can be obtained from the joint honorary secretaries, Ramsay Memorial Fellowships Trust, University College, Gower Street, London, W.C.1. Completed application forms must be received not later than 21 April.

Oil Refinery near Newcastle?

Speaking at a luncheon after he had opened an 'Oil for Britain' exhibition at Newcastle, the Mayor, Alderman W. McKeag, said: 'May I say in the name of the mayors and representatives of councils who are here today that we would welcome the opportunity of trying to provide facilities for an oil refinery.'

All Industrialists Invited

Mr. Tom Williamson, C.B.E., J.P., General Secretary of the National Union of General and Municipal Workers and joint chairman of the British Productivity Council, is addressing the Institution of Works Managers on 'Productivity and the Trade Unions' at 7 p.m. on Wednesday, 10 March, at the Waldorf Hotel, London, W.C.2. To enable industrialists generally to hear the speaker on this vital subject of the moment, IWM have made this meeting an open one, and invite the attendance of those interested in productivity. No tickets are required.

Nutrition Panel Elections

The annual general meeting of the Food Group Nutrition Panel of the Society of Chemical Industry will be held in the Chemical Society's rooms at Burlington House on Wednesday, 24 March. Principal business will be the annual report of the committee and the election of officers.

Pig-iron Imports

In the House of Commons last week, Sir L. Ropner asked the Minister of Supply the amount of pig-iron imported from the USSR in 1953 and the quantity which would be imported under existing contracts this year. Mr. A. R. W. Low, Parliamentary Secretary to the Ministry of Supply, replied that no pig-iron was imported from the USSR in 1953 and as pig-iron could be imported freely under open general licence he was unable to give the forecast requested in the second part of the question.

Change of Address

Departments of Dawe Instruments Ltd. are now operating from the following addresses: sales and showroom, 99 Uxbridge Road, Ealing, W.5 (Tel. EALing 6215); stores and despatch, 7 Spur Road, Isleworth, Middlesex (Tel. HOunslow 8043/4); accounts and service, Harlequin Avenue, Great West Road, Brentford, Middlesex (Tel. EALing 1850/9).

'Deodoriser Masked Gas Smell'

At an inquest on a man found gassed in the kitchen at his home in Deptford, Mr. John Crane, assistant physicist, South Eastern Gas Board, stated that when a deodoriser found in the kitchen was present in experiments in the board's laboratory, some of the people there were unable to appreciate concentration of coal gas. He believed gas from a fractured main had seeped through a faulty wall into the kitchen. A verdict of 'Accidental Death' was returned.

Deep Drilling for Natural Gas

Deep drilling for natural gas has begun at Cousland, near Dalkeith, Midlothian, Scotland, as part of the Gas Council's five-year search. The presence of natural gas in this area is known as a result of borings made before the war, but further drilling is necessary to establish the extent of the reserve. This is the first deep drilling to be undertaken by the D'Arcy Exploration Company on behalf of the Gas Council, although preliminary survey work has been proceeding for some weeks in Yorkshire, Lincolnshire and Sussex.

• OVERSEAS •

German Aluminium Production

According to a statement of the German Aluminium Centre, a total of 110,473 tons of aluminium was produced in the German Federal Republic during 1953. With this figure, Western Germany ranks second among the aluminium-producing countries of the Organisation for European Economic Co-operation.

New Sydney Factory

Construction of a new chemical factory costing £250,000,000 will begin soon near Sydney. It will be built by the Colonial Sugar Refinery Chemicals Pty. Ltd., and will manufacture polystyrene moulding powder. Plans for the new factory are being drawn up at the Distillers' Co. Ltd., of London, which owns a 41 per cent share in Colonial Sugar Refinery Chemicals, of Sydney.

Holland & Whale Oil

The importance of whale oil in Holland's economy was emphasised in the directors' report at the recent annual meeting of the Nederlandse Maatschappij Voor De Walvischvaart at Amsterdam. A new whaling factory vessel is due to replace the present vessel in the 1955-56 season, when the latter will be used as a storage vessel.

Southern Rhodesian Minerals

The total value of all minerals produced in Southern Rhodesia during 1953 was £19,491,445, it was announced in Salisbury recently by the Division of Mines and Transport. The total value of all gold produced during the year, including premium sales, was £6,440,236. Other values for the year included: asbestos, £6,542,731; chrome, £2,927,783; copper, £28,202; copper ore, £5,471.

Asbestos under Lake

The Quebec Government have announced that about $20,000,000 will be spent during the next few months to reach deposits of asbestos beneath Black Lake, 50 miles south of Quebec City. The lake will be drained to reach the deposits, which are estimated at 50,000,000 tons. The money for development will come from the American Smelting & Refining Co., which is entering into a joint project with the United Asbestos Corporation.

French Pitchblende Find

The discovery of deposits of pitchblende, believed to be the richest in France, has been announced by the French Atomic Energy Commission.

Margarine in Nigeria

Nigeria's first margarine factory, established by Van den Bergh (Nigeria) Ltd., was opened on Saturday, 20 February. It cost £60,000 and will employ 80 workers, only one of whom is a European.

Canadian Plant Expansion

The Fluor Corporation Ltd., of Canada, has been awarded the contract for the engineering and construction of a $3,000,000 ammonia plant expansion of Dow Chemical of Canada Ltd., at Sarnia.

Italian Mercury

Mercury production in Italy now amounts to approximately 2,000 short tons a year; 80 per cent is exported and the remainder meets domestic needs. After the loss of the Istrian mines at Idria in 1945 and the war destruction in the Amiata district, Italy has again risen to first place in world production of this mineral. The Mount Amiata mines could yield larger quantities if the demand for mercury increased.

German Mineral Oil

The output of mineral oil in the German Federal Republic is at present able to meet 30 per cent of the German demand, according to a statement made at the recent annual meeting of the German Association for Mineral Oil Science and Coal Chemistry. In October, 1953, the mineral oil output of West Germany reached almost 200,000 tons. This is a new record.

Paint Additives in Brazil

Nuodex Products Co. Inc., Elizabeth, N.J., has just formed a new Brazilian company, Nuodex SA. Industria e Comercio de Secantes, to manufacture chemical driers, fungicides and other additives for the Brazilian paint and ink industries. The company's headquarters are in Rio de Janeiro, but branches will be established in Sao Paulo and Rio Grande do Sul. Until now these chemicals had to be imported from the US or from Britain or other European countries.

PERSONAL

The Milk Marketing Board, announcing new appointments this week, stated that MR. J. EDWARDS will continue as chief of the production division and scientific adviser to the Board.

MR. C. H. COLTON, an assistant managing director of British Celanese Ltd., has accepted an invitation from the Council of the Textile Institute to be nominated as the Institute's next president. A member of the Institute since January, 1930, Mr. Colton was chairman of the London Section of the Institute from 1938 to 1940. For some considerable time, Mr. Colton has been closely connected with the British Rayon and Synthetic Fibres Federation, and has served on various of the Federation's committees. He is a member of Council of the British Rayon Reasearch Association.

MR. G. E. TAYLOR, MR. W. J. MILLAR and MR. A. C. GEDDES have resigned from the board of the Electric Furnace Co. Ltd.

The council of the University of Bristol has confirmed the appointment of PROFESSOR D. H. EVERETT, M.A., B.Sc., D.Phil., F.R.S. (Edin.), of University College, Dundee, to the Leverhulme Chair of Inorganic and Physical Chemistry from 1 September.

Recent changes in the Industrial Chemicals sales organisation of Carbide and Carbon Chemicals Company, a division of Union Carbide and Carbon Corporation have been announced. MR. R. M. JOSLIN, who was Central Division sales manager located in Chicago, has been appointed assistant sales manager, Industrial Chemicals. Mr. Joslin will assume his duties shortly in the New York office of the company. MR. E. R. YOUNG has been appointed Central Division sales manager. Mr. Young will supervise the Central Division from Carbide's offices in Cleveland, Ohio. MR. W. M. ANDERSON has been appointed district sales manager of the Cleveland district sales office. MR. R. G. METZ has been appointed district sales manager for the Indianapolis district office.

MR. A. E. ILIFFE, director and general sales manager, The Benjamin Electric Ltd., left for an overseas business tour on Wednesday, 24 February. His object in visiting the various countries is to make contact at director level with the main distributors.

He is visiting India, New Zealand and Australia in that order, with a few days in Singapore en route. Arriving in Calcutta on 26 February he will be approximately three weeks in India, going to Karachi, Bombay and Madras after Calcutta. From Singapore, Mr. Iliffe proceeds direct to Wellington, New Zealand, arriving approximately 29 March, and also visiting Auckland, Dunedin, etc. Arriving in Sydney, Australia, around 23 April, he will stay two months in the country, with calls in the main cities and towns as far apart as Perth in Western Australia. Mr. Iliffe expects to be back in London towards the end of June.

Obituary

MR. HENRY SIMONIS, the deputy chairman of British Paints Ltd., died on Monday, 22 February, after a long illness.

New Edinburgh Chair

A chair of Chemical Technology and a new degree of Bachelor of Technological Science have been approved by the University Court of Edinburgh University. The decision has been taken in co-operation with the Heriot-Watt College, Edinburgh. The Department of Chemical Technology will be housed in the Heriot-Watt College and the Professor, although Head of the University Department, will also act as Head of the Department within the College.

Publications & Announcements

THE Purchasing Officers' Association has now completed the publication of a set of 18 booklets surveying the principal raw materials and has arranged for these booklets to be available in bound form at a price of 20s. Binding is in maroon leather cloth. The contents include the following: 'Chemicals & Fertilisers,' by F. R. King; 'Natural & Synthetic Fibres,' various authors; 'Oils & Fats,' J. F. Blitz; 'Rubber,' A. F. Brazier; 'Petroleum,' G. Sell; 'Raw Materials of the Iron & Steel Industry,' A. K. Osborn; 'Non-ferrous Metals,' H. H. C. Wood; and 'Precious Metals,' Dr. L. B. Hunt.

* * *

VOLUME III of Pétrole—Propriétés et Utilisations,' by J. Pévost (Presses Documentaires, Paris, 1954, Pp. 316, F.1950) is concerned with lubricants and the technique of lubrication. It is well illustrated with diagrams and graphs.

* * *

NUMBER 101 of the *Ciba Review*, published by Ciba Ltd., Basle, Switzerland, is devoted to a study of chromium: its history, distribution, use in chrome mordants and complex dyes, as chromates in the textile industry, in tanning, and in the manufacture of chromium alloy plant. Other features deal with modern trends in printing, dyeing and finishing, and the applications of Ciba products in these operations.

* * *

NEW this year is the 'M. & B. Laboratory Bulletin.' Published by May & Baker Ltd., Dagenham, England, it is intended to make and maintain contact with the company's friends throughout the chemical world. Contents will include information on the application of laboratory chemicals of topical interest, on procedures evolved in the company's laboratories, and on new apparatus. Also, a limited number of abstracts will be made from publications which may not be seen by the majority of the bulletin's readers. Volume 1, No. 1, contains an article on petroleum chemistry by Dr. J. H. Beynon, of Thornton Research Centre, a note on a laboratory gas scrubbing tower, a description of teaching chemistry in a secondary modern school, and details of potassium borohydride.

THE possibilities of 'A Career in the Gas Industry' for young men leaving school or university are outlined in a booklet of that title, just issued by the Gas Council. It emphasises the wide range of openings available, the opportunities for promotion, and the progressive policy of the industry, which offers a satisfying career to those who enter it, whether on the technical, scientific or administrative side. The booklet stresses that it is the policy of the industry to maintain its reputation as a good employer and to provide for its employees remuneration and conditions of service which are comparable with those offered by any other industry in the country. The various pupillage schemes are outlined, these being available both for university graduates and for those leaving secondary or public schools. Copies of the booklet may be obtained from Gas Boards or through the Youth Employment Offices of the Ministry of Labour.

* * *

A LICENCE agreement with The Bristol Company of Waterbury, Connecticut, USA, has been concluded by Elliott Brothers (London) Ltd., Century Works, Lewisham, S.E.13, who for more than a century and a half have been the leading British producers of instruments for industrial purposes. Announcing the agreement, an official of the latter firm said: 'Productivity teams which have been to the USA to study the methods of their American opposite numbers have all reported on the wider use of instruments in the plants they have visited compared with those at home. Much of the instrumentation and control equipment they have seen has not been available in Europe without dollar imports. That is why we have taken this step to incorporate well-accepted US designs in our range.'

* * *

MODERN methods requiring rapid assembly of components demand a versatile range of silver brazing alloys, and to meet this demand, Baker Platinum Ltd., 52 High Holborn, London, W.C.1, offer a wide selection of 'Silvaloy' in rod, wire, strip or foil. Details of the physical properties of these alloys, their appropriate uses, and their relative costs are given in a brochure obtainable from the company.

British Chemical Prices

LONDON.—There has been little change either as regards prices or conditions on the industrial chemicals market during the past week. A steady flow of contract delivery specifications has been reported and the placing of new forward delivery contracts has been reasonably good. The majority of the day to day or routine soda and potash chemicals remain in persistent call. The only feature on the coal tar products market is the scarcity relative to the demand of toluol and xylol. Creosote oil is in good request and the demand for cresylic acid is perhaps a little better of late.

MANCHESTER.—On the whole, the demand for chemical products on the Manchester market during the past week has been about maintained at its recent level, a slight setback in one or two directions having been offset by improvement in others. The soda compounds, as are the majority of heavy products, are being taken up in good quantities against contracts and a fair number of fresh inquiries are coming on to the market. Prices generally maintain a steady front. The call for a number of items in the fertiliser section continues to show a gradual expansion, and a steady trade in the tar products is reported.

GLASGOW.—The demand from the textile trade still remains very brisk and from all reports the past week has been well filled with orders for spot and forward delivery from all sections of the trade. Prices have on the whole remained steady in the home market and the past week has also seen some very interesting inquiries for general chemicals for export.

General Chemicals

Acetic Acid.—Per ton : 80% technical, 10 tons, £86. 80% pure, 10 tons, £92 ; commercial glacial 10 tons, £94 ; delivered buyers' premises in returnable barrels ; in glass carboys, £7 ; demijohns, £11 extra.

Acetic Anhydride.—Ton lots d/d, £130 per ton.

Acetone.—Small lots : 5-gal. drums, £136 per ton ; 10-gal. drums, £126 per ton. In 40/45-gal drums less than 1 ton, £101 per ton ; 1 to 9 tons, £98 per ton ; 10 to 49 tons, £96 per ton ; 50 tons and over, £95 per ton. All per ton d/d.

Alum.—Ground, about £23 per ton, f.o.r. MANCHESTER : Ground, £25.

Aluminium Sulphate.—Ex works, £14 15s. per ton d/d. MANCHESTER : £14 10s. to £17 15s.

Ammonia, Anhydrous.—1s. 9d. to 2s. 3d. per lb.

Ammonium Bicarbonate.—2 cwt. non-returnable drums ; 1 ton lots £58 per ton.

Ammonium Chloride. — Grey galvanising, £31 5s. per ton, in casks, ex wharf. Fine white 98%, £25 to £27 per ton. See also Salammoniac.

Ammonium Nitrate.—D/d, £18 to £20 per ton.

Ammonium Persulphate. — MANCHESTER : £6 5s. per cwt. d/d.

Ammonium Phosphate.—Mono- and di-, ton lots, d/d, £93 and £91 10s. per ton.

Antimony Sulphide.—Golden, d/d in 5-cwt. lots as to grade, etc., 2s. 2d. to 2s. 8d. per lb. Crimson, 3s. 4½d. to 4s. 5½d. per lb.

Arsenic.—Per ton, £59 5s. nominal, ex store.

Barium Carbonate.—Precip., d/d : 4-ton lots, £39 per ton ; 2-ton lots, £39 10s. per ton, bag packing.

Barium Chloride.—£42 15s. per ton in 2-ton lots.

Barium Sulphate (Dry Blanc Fixe).—Precip., 4-ton lots, £42 10s. per ton d/d ; 2-ton lots, £43 per ton d/d.

Bleaching Powder.—£21 per ton in casks (1 ton lots).

Borax.—Per ton for ton lots, in free 140-lb. bags, carriage paid : Anhydrous, £58 10s.; in 1-cwt. bags ; commercial, granular, £38 10s. ; crystal, £41 ; powder, £42 ; extra fine powder, £43 ; B.P., granular, £47 10s. ; crystal, £50 ; powder, £51 ; extra fine powder, £52.

Boric Acid.—Per ton for ton lots in free 1-cwt. bags, carriage paid : Commercial, granular, £67 ; crystal, £75 ; powder, £72 10s. ; extra fine powder, £74 10s. ; B.P., granular, £80 ; crystal, £84 10s. ; powder, £87 ; extra fine powder, £86 10s.

Butyl Acetate BSS.—£173 per ton, in 1-ton lots ; £171 per ton, in 10-ton lots.

***n*-Butyl alcohol, BSS.**—10 tons, in drums, £161 10s. per ton d/d.

***sec.*-Butyl Alcohol.**—5 gal. drums £159 ; 40 gal. drums : less than 1 ton £124 per ton ; 1 to 10 tons £123 per ton ; 10 tons and over £122 per ton ; 100 tons and over £120 per ton.

***tert.*-Butyl Alcohol.**—5 gal. drums £195 10s. per ton ; 40/45 gal. drums : less than 1 ton £175 10s. per ton ; 1 to 5 tons £174 10s. per ton ; 5 to 10 tons, £173 10s. ; 10 tons and over £172 10s.

Calcium Chloride.—70/72% solid £12 10s. per ton.

Chlorine, Liquid.—£32 per ton d/d in 16/17-cwt. drums (3-drum lots).

Chromic Acid.—£220 13s. 6d. per ton, less 2½%, d/d U.K., in 1-ton lots.

Chromium Sulphate, Basic.—Crystals, £65 6s. 8d. per ton d/d U.K., in lots of 1 ton and over.

Citric Acid.—1-cwt. lots, 205s. cwt. ; 5-cwt. lots, 200s. cwt.

Cobalt Oxide.—Black, delivered, 13s. per lb.

Copper Carbonate.—MANCHESTER : 2s. 2d. per lb.

Copper Sulphate.—£74 per ton f.o.b., less 2% in 2-cwt. bags.

Cream of Tartar.—100%, per cwt., about £9 12s.

Diacetone Alcohol.—Small lots : 5 gal. drums, £177 per ton ; 10 gal. drums, £167 per ton. In 40/45 gal. drums ; less than 1 ton, £142 per ton ; 1 to 9 tons, £141 per ton ; 10 to 50 tons, £140 per ton ; 50 to 100 tons, £139 per ton ; 100 tons and over, £138 per ton.

Ethyl Acetate.—10 tons lots, d/d, £135 per ton.

Ethyl Alcohol (PBS 66 o.p.).—Over 300,000 p. gal., 2s. 9d. ; 2,500-10,000 p. gal., 2s. 11½d. per p. gal., d/d in tankers. D/d in 40/45-gal. drums, 1d. p.p.g. extra. Absolute alcohol (75.2 o.p.) 5d. p.p.g. extra.

Formaldehyde.—£37 5s. per ton in casks, d/d.

Formic Acid.—85%, £82 10s. in 4-ton lots, carriage paid.

Glycerine.—Chemically pure, double distilled 1.260 S.G., £14 7s. 6d. per cwt. Refined pale straw industrial, 5s. per cwt. less than chemically pure.

Hydrochloric Acid.—Spot, about 12s. per carboy d/d, according to purity, strength and locality.

Hydrofluoric Acid.—59/60%, about 1s. to 1s. 2d. per lb.

Hydrogen Peroxide.—27.5% wt. £124 10s. per ton. 35% wt. £153 per ton d/d. Carboys extra and returnable.

Iodine.—Resublimed B.P., 16s. 4d. per lb. in 28 lb. lots.

Iodoform.—25s. 10d. per lb. in 28 lb. lots.

Lactic Acid.—Pale tech., 44 per cent by weight £122 per ton ; dark tech., 44 per cent by weight £67 per ton ex works 1-ton lots ; dark chemical quality 44 per cent by weight £109 per ton, ex works ; usual container terms.

Lead Acetate.—White : About £132 per ton.

Lead Nitrate.—About £112 per ton.

Lead, Red.—Basis prices per ton. Genuine dry red lead, £111 10s. ; orange lead, £123 10s. Ground in oil : red, £133 5s. ; orange, £145 5s.

Lead, White.—Basis prices : Dry English in 5-cwt. casks, £119 5s. per ton. Ground in oil : English, under 2 tons, £125 5s.

Lime Acetate.—Brown, ton lots, d/d, £40 per ton ; grey, 80-82%, ton lots, d/d, £45 per ton.

Litharge.—£113 10s. per ton, in 5-ton lots.

Magnesite.—Calcined, in bags, ex works, £22 to £24.

Magnesium Carbonate.—Light, commercial, d/d, 2-ton lots, £84 10s. per ton, under 2 tons, £92 per ton.

Magnesium Chloride.—Solid (ex wharf), £14 10s. per ton.

Magnesium Oxide.—Light, commercial, d/d, under 1-ton lots, £245 per ton.

Magnesium Sulphate.—£15 to £16 per ton.

Mercuric Chloride.—Technical Powder, 17s. 6d. per lb. in 5-cwt. lots ; smaller quantities dearer.

Mercury Sulphide, Red.—22s. 3d. per lb., for 5-cwt. lots.

Methanol.—Pure synthetic, d/d, £28 to £38 per ton.

Methylated Spirit.—Industrial 66° o.p. : 500 gal. and over in tankers, 4s. 10d. per gal. d/d ; 100-499 gal. in drums, 5s. 2½d. per gal. d/d. Pyridinised 64 o.p. : 500 gal. and over in tankers, 5s. 0d. per gal. d/d ; 100-499 gal. in drums, 5s. 4½d. per gal. d/d.

Methyl Ethyl Ketone.—10-ton lots, £141 per ton del.

Methyl *iso*Butyl Ketone.—10 tons and over £162 per ton.

Nickel Sulphate.—D/d, buyers U.K. £154 per ton. Nominal.

Nitric Acid.—£35 to £40 per ton, ex-works.

Oxalic Acid.—Home manufacture, minimum 4-ton lots, in 5-cwt. casks, £127 10s. per ton, carriage paid.

Phosphoric Acid.—Technical (S.G. 1.700) ton lots, carriage paid, £87 per ton; B.P. (S.G. 1.750), ton lots, carriage paid, 1s. 3½d. per lb.

Potash, Caustic.—Solid, £94 10s. per ton for 1-ton lots; Liquid, £37 15s.

Potassium Carbonate. — Calcined, 96/98%, £59 10s. per ton for 1-ton lots, ex-store.

Potassium Chloride.—Industrial, 96%, t-ton lots, £23 to £25 per ton.

Potassium Dichromate.—Crystals and granular, 11⅝d. per lb., in 1-ton lots, d/d UK.

Potassium Iodide.—B.P., 14s. 10d. per lb. in 28-lb. lots; 14s. 4d. in cwt. lots.

Potassium Nitrate.—Small granular crystals, 81s. per cwt. ex store, according to quantity.

Potassium Permanganate.—B.P., 1s. 9½d. per lb. for 1-cwt. lots; for 3 cwt. and upwards, 1s. 8½d. per lb.; technical, £8 7s. per cwt.; for 5-cwt. lots.

***iso*Propyl Alcohol.**—Small lots: 5 gal. drums, £118 per ton; 10-gal. drums, £108 per ton; in 40-45 gal. drums; less than 1 ton, £83 per ton; 1 to 9 tons £81 per ton; 10 to 50 tons, £80 10s. per ton: 50 tons and over, £80 per ton.

Salammoniac.—Dog-tooth crystals, £70 per ton; medium, £67 10s. per ton; fine white crystals, £21 10s. to £22 10s. per ton, in casks.

Salicylic Acid. — MANCHESTER: Technical 2s. 7d. per lb. d/d.

Soda Ash.—58% ex-depot or d/d, London station, about £14 3s. per ton.

Soda, Caustic.—Solid 76/77%; spot, £26 to £28 per ton d/d. (4 ton lots).

Sodium Acetate.—About £80 per ton d/d.

Sodium Bicarbonate.—Refined, spot, £13 10s. to £15 10s. per ton, in bags.

Sodium Bisulphite.—Powder, 60/62%, £40 per ton d/d in 2-ton lots for home trade.

Sodium Carbonate Monohydrate.—£25 per ton d/d in minimum ton lots in 2-cwt. free bags.

Sodium Chlorate.—£75 15s. to £82 per ton.

Sodium Cyanide.—100% basis, 9¾d. to 10¾d. per lb.

Sodium Dichromate.—Crystals, cake and powder, £91 per ton, d/d UK, minimum 1-ton lots; anhydrous, £105 per ton, d/d UK, minimum 1-ton lots.

Sodium Fluoride.—D/d, £4 10s. per cwt.

Sodium Hyposulphite.—Pea crystals £28 a ton; commercial, 1-ton lots, £26 per ton carriage paid.

Sodium Iodide.—B.P., 16s. 4d. per lb. in 28-lb. lots.

Sodium Metaphosphate (Calgon).—Flaked, loose in metal drums, £123 ton.

Sodium Metasilicate.—£22 15s. per ton, d/d U.K. in ton lots.

Sodium Nitrate.—Chilean Industrial, over 98% 6-ton lots, d/d station, £27 10s.

Sodium Nitrite.—£31 per ton (4-ton lots).

Sodium Percarbonate.—12½% available oxygen, £8 2s. 10½d. per cwt. in 1-cwt. drums.

Sodium Phosphate.—Per ton d/d for ton lots: Di-sodium, crystalline, £37 10s., anhydrous, £78 10s.; tri-sodium, crystalline, £39 10s., anhydrous, £75 10s.

Sodium Prussiate.—1s. to 1s. 1d. per lb. ex store.

Sodium Silicate.—£6 to £11 per ton.

Sodium Sulphate (Glauber's Salt).—About £8 10s. per ton d/d.

Sodium Sulphate (Salt Cake).—Unground. £6 per ton d/d station in bulk. MANCHESTER: £6 10s. per ton d/d station.

Sodium Sulphide.—Solid, 60/62%, spot, £30 17s. 6d. per ton, d/d, in drums; broken, £31 12s. 6d. per ton, d/d, in drums.

Sodium Sulphite.—Anhydrous, £59 per ton; pea crystals, £37 12s. 6d. per ton d/d station in kegs; commercial, £23 7s. 6d. per ton d/d station in bags.

Sulphur.—Per ton for 4 tons or more, ground, £23 11s. to £26, according to fineness.

Tartaric Acid.—Per cwt. : 10 cwt. or more, £10 10s.

Titanium Oxide.—Standard grade comm., with rutile structure £143 per ton; standard grade comm., £130 per ton.

Zinc Oxide.—Maximum price per ton for 2-ton lots, d/d : white seal, £92 10s. ; green seal, £91 10s. ; red seal, £90.

Rubber Chemicals

Antimony Sulphide.—Golden, 2s. 3½d. to 3s. 1½d. per lb. Crimson, 3s. 4½d. to 4s. 5½d. per lb.

Carbon Bisulphide.—£60 to £65 per ton, according to quality.

Carbon Black.—6d. to 8d. per lb., according to packing.

Carbon Tetrachloride.—Ton lots, £74 10s. per ton.

India-rubber Substitutes.—White, 1s. 6¾d. to 1s. 10½d. per lb. ; dark, 1s. 4½d. to 1s. 8d. per lb.

Lithopone.—30%, £50 per ton.

Mineral Black.—£7 10s. to £10 per ton.

Sulphur Chloride.—British, £55 per ton.

Vegetable Lamp Black.—£64 8s. per ton in 2-ton lots.

Vermilion.—Pale or deep, 15s. 6d. per lb. for 7-lb. lots.

Nitrogen Fertilisers

Ammonium Sulphate.—Per ton in 6-ton lots, d/d farmer's nearest station, £16 2s. 6d.

Compound Fertilisers.—Per ton in 6 ton lots, d/d farmer's nearest station, I.C.I. Special No. 1 £27 9s.

'Nitro-Chalk.'—£12 9s. 6d. per ton in 6-ton lots, d/d farmer's nearest station.

Sodium Nitrate.—Chilean agricultural for 6-ton lots, d/d nearest station, March to June, £26 12s. 6d. per ton.

Coal-Tar Products

Benzole.—Per gal., minimum of 200 gals. delivered in bulk, 90's, 4s. 10¾d. ; pure, 5s. 2d.

Carbolic Acid.—Crystals, 1s. 4d. to 1s. 6½d. per lb. Crude, 60's, 8s. MANCHESTER : Crystals, 1s. 4½d. to 1s. 6½d. per lb., d/d crude, 8s. naked, at works.

Creosote.—Home trade, 1s. to 1s. 4d. per gal., according to quality, f.o.r. maker's works. MANCHESTER : 1s. to 1s. 8d. per gal.

Cresylic Acid.—Pale 99/99½%, 5s. 8d. per gal. ; 99.5/100%, 5s. 10d. American, duty free, for export, 5s. to 5s. 8d. naked at works.

Naphtha.—Solvent, 90/160°, 4s. 10d. per gal. for 1000-gal. lots ; heavy, 90/190°, 3s. 9½d. per gal. for 1000-gal. lots, d/d. Drums extra : higher prices for smaller lots.

Naphthalene.—Crude, 4-ton lots, in sellers' bags, £14 12s. to £22 per ton, according to m.p. ; hot pressed, £28 per ton in bulk ex-works ; purified crystals, £53 per ton d/d.

Pitch.—Medium, soft, home trade, 160s. per ton f.o.r. suppliers' works ; export trade, 230s. per ton f.o.b. suppliers port.

Pyridine.—90/160°, 32s. 6d. to 35s. per gal. MANCHESTER : 42s. 6d. to 45s. per gal.

Toluol.—Pure, 5s. 7d. ; 90's, 4s. 10d. per gal., d/d. MANCHESTER : Pure, 5s. 8d. per gal. naked.

Xylol.—For 1000-gal. lots, 5s. 8d. to 5s. 10d. per gal., according to grade, d/d.

Intermediates and Dyes
(Prices Nominal)

***m*-Cresol** 98/100%.—3s. 9d. per lb. d/d.

***o*-Cresol** 30/31° C.—1s. 4d. per lb. d/d.

***p*-Cresol** 34/35° C.—3s. 9d. per lb. d/d.

Dichloraniline.—2s. 8½d. per lb.

Dinitrobenzene.—88/89°C., 1s. 11d. per lb.

Dinitrotoluene.—S.P. 15° C., 1s. 11½d. per lb. ; S.P. 26° C., 1s. 3d. per lb. S.P. 33°C., 1s. 1½d. per lb. ; S.P. 66/68°C., 1s. 9d. per lb.

***p*-Nitraniline.**—4s. 5½d. per lb.

Nitrobenzene.—Spot, 9½d. per lb. in 90-gal. drums, drums extra, 1-ton lots d/d buyers' works.

Nitronaphthalene.—2s. per lb.

***o*-Toluidine.**—1s. 7d. per lb., in 8/10-cwt. drums, drums extra.

***p*-Toluidine.**—5s. 6d. per lb., in casks.

Dimethylaniline.—3s. 1d. per lb., packed in drums, carriage paid.

Prices for Unrefined & Refined Oils

Minister of Food Announces Changes

CHANGES in the prices of both unrefined and refined oils allocated during the current allocation periods have been announced by the Minister of Food, Major the Rt. Hon. Gwilym Lloyd-George, as follows:—

PRICES OF UNREFINED OILS TO PRIMARY WHOLESALERS AND LARGE TRADE USERS DURING THE FOUR WEEKS WHICH BEGAN 21 FEBRUARY, 1954

Coconut oil	Crude and crude oleine	from £134	to £138	Per ton naked ex-works
Palm kernel oil	Crude and crude oleine	,, £133	,, £137	
Cottonseed oil	Crude	,, £136	,, £144	
	Washed	,, £144	,, £154	
Groundnut oil	Crude	,, £147	,, £157	
Palm Oil		,, £71	,, £74	Per ton c.i.f. in casks, to be returned
		,, £71	,, £74	Per ton c.i.f. in loan drums
		,, £70	,, £73	Per ton c.i.f. in bulk
Herring oil	Crude	,, £75	,, £85	Per ton naked ex-store
Whale oil	Crude No. 1	,, £80	,, £90	
Whale/Herring oil	Crude hardened up to 42°	,, £92	,, £102	
	46°/48°	,, £93	,, £103	
	50°/52°	,, £94	,, £104	
	54°	,, £94/10	,, £104/10	
Iodine value 3/5		,, £94/10	,, £104/10	
Cotton-black grease		,, £20	,, £10	
Cotton acid oil ex-washed oil		,, £55	,, £50	Per ton naked ex-works
Groundnut acid oil		,, £55	,, £50	
Mixed soft acid oils		,, £55	,, £50	
Mixed acid oil	Ex-hardened oils	,, £40	,, £35	
	Ex-margarine and compound refineries	,, £40	,, £35	

(*N.B.*—The entries relating to crude maize oil and maize acid oil are deleted from the list because the Ministry has no further supplies of these materials available.)

PRICES OF REFINED OILS TO PRIMARY WHOLESALERS AND LARGE TRADE USERS DURING THE EIGHT WEEKS WHICH BEGAN 21 FEBRUARY, 1954

Coconut oil	Refined deodorised	from £147	to £152	Per ton naked ex-works
	Refined hardened deodorised	,, £153	,, £159	
Palm kernel oil	Refined deodorised	,, £144	,, £149	
	Refined hardened deodorised	,, £150	,, £156	
Cottonseed oil	Refined deodorised	,, £162	,, £172	
Groundnut oil	Refined deodorised	,, £167	,, £177	
	Refined hardened deodorised to 40°	,, £180	,, £193	
	50°/52°	,, £181	,, £194	
Palm oil	Refined deodorised	,, £101	,, £102	
	Refined hardened deodorised	,, £110	,, £111	
Whale oil	Refined hardened deodorised to 42°	,, £98	,, £109	
	46°/48°	,, £99	,, £110	

The 1954 'Minibition'

THE Purchasing Officers Association is holding its fifth 'Minibition' at the Royal Hall, Harrogate, from 30 September to 2 October, in conjunction with its 1954 national conference.

The association members, numbering 3,500, all hold responsible purchasing appointments in industrial or public undertakings and the 'Minibition' is planned as an educational feature of the conference to give manufacturers an opportunity of bringing to their notice the latest information regarding new products and developments in quality and design.

Exhibits are displayed on small stands of standard size and design. In previous years all available stands have been quickly reserved and, as this year space is more limited than usual, any firms interested in taking part are advised to make early application to the association at Wardrobe Court, 146a, Queen Victoria Street, London, E.C.4.

Chemical & Allied Stocks & Shares

STOCK markets have reacted after a strong advance, but industrial shares show many big gains on the month. Nevertheless earlier optimism has given way to a somewhat more cautious attitude. It is now generally recognised that the financial year cannot end with more than a very modest surplus, and that consequently the scope for tax reductions will be very limited. A 6d. reduction in the standard rate of income tax is still being widely expected in the City, and it is assumed there may be minor tax adjustments in other directions. The main stimulus to industrial shares is of course the general tendency, still in evidence, for leasing companies to relax the exceptionally conservative dividend policy they have followed since the war.

Main talking point in the City is of course the pending £30,000,000 issue of 4½ per cent loan stock by Imperial Chemical Industries. This offer, which is to be made to the company's ordinary and preference shareholders, is the largest issue ever made by a joint stock company. The loan stock is to be offered at par, £100 for each £100 of stock. Heavy oversubscription is being expected in the City with a premium of up to £2 over the issue price when dealings start next month. The facts and figures given by the company in its reply to the Labour Party's nationalisation threat have attracted widespread attention. There can be no doubt of the group's big achievements and progressive outlook. Since the war capital expenditure has amounted to £210,000,000 to date, of which as much as £150,000,000 has been provided from retained profits, and only £60,000,000 from new capital issue. Now the dividend policy is to be a little more generous, as the directors foreshadow a total of 15 per cent for the past year, an increase of 2 per cent. Market view is that for the current year the dividend may very well be up to 9 per cent on the doubled capital that will result from the 100 per cent share bonus; and when the shares go 'ex' the bonus later this year, the assumption is that they may very well be around 30s. This week they have shown renewed activity and are 58s. 3d. at the time of writing, while the preference shares gained 1s. at 29s. 1½d. Other chemical shares have also been more active with Albright & Wilson 5s. shares up to 19s. 7½d. on higher dividend hopes, while Borax Consolidated deferred units were 45s. following the raising of the dividend from 10 per cent to 11 per cent. Monsanto Chemical 5s. shares moved up to 25s. 7½d. on the higher dividend. Laporte 5s. shares were 14s. 3d. Hickson & Welch 10s. shares were around par, Fisons have moved up to 44s. 9d., and British Chrome Chemicals 5s. shares were 17s. 6d. Higher dividend hopes put Brotherton 10s. shares up to 27s. 6d. Greeff-Chemicals Holdings 5s. shares were 17s., and Boake Roberts 5s. shares 11s. William Blythe 3s. shares have been active around 7s. Reichhold Chemical 5s. shares showed firmness at 8s. 7½d. and Yorkshire Dyeware 5s. shares were 8s. 6d. Plastics shares were also more active, with British Xylonite favoured up to 32s. 9d. on higher dividend hopes, while Bakelite 10s. shares were 26s. 9d., and British Industrial Plastics 2s. shares 5s. 7½d. Coalite & Chemical 2s. shares have again changed hands around 2s. 6d. British Glues & Chemicals 4s. shares have been firm at 11s. 6d. Elsewhere, the 4s. units of the Distillers Co. were higher on balance at 18s. 7½d., and Turner & Newall 72s. 3d. Unilever at 60s. 4½d. were better on balance for the month. Triplex Glass 10s. shares changed hands around 23s. Oils have been prominently active again with Anglo-Iranian up to 195s. 7½d. on hopes of a Persian settlement. Shell were 97s. 6d.

Visqueen Production

BRITISH Visqueen Ltd. have now assumed I.C.I.'s responsibilities for polythene film and have begun marketing 'Visqueen.' I.C.I.'s product, sold for many years as 'Alkathene' film, has been withdrawn to make way for the improved quality 'Visqueen.' British Visqueen Ltd. now have the largest production and sales outside the USA, and when the company's new factory at Stevenage is completed in July, existing production capacity will be doubled. Provision is being made for extensions.

The new factory, planned solely to produce 'Visqueen,' will be, it is said, the most modern and efficient unit of its kind in the world, incorporating productivity features from both this country and the USA.

Law & Company News

Commercial Intelligence

The following are taken from the printed reports, but we cannot be responsible for errors that may occur.

Mortgages & Charges

(Note.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described herein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every company shall, in making its Annual Summary, specify the total amount of debt due from the company in respect of all Mortgages or Charges. The following Mortgages or Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary but such total may have been reduced.)

BITUMEN INDUSTRIES LTD. (incorporated in Scotland). 22 January, charge, to Barclays Bank Ltd. securing all moneys due or to become due to the bank; charged on building, 65 Slough Trading Estate, Slough.

BRITISH CHEMICAL PRODUCTS & COLOURS LTD., London, W.C. 16 January, £2,600 charge, to S. R. Lloyd, Reigate; charged on Bishopsdown, Lubbock Road, Chislehurst, also certain land with buildings, adjoining. *Nil. 27 January, 1953.

Company News

Imperial Chemical Industries, Limited

£30,000,000 Issue of Unsecured Stock

THE board of Imperial Chemical Industries Ltd. announce that, having received the consent of HM Treasury, they have created £30,000,000 of 4½ per cent Unsecured Loan Stock 1972/74, which they propose to offer at par to the Preference and Ordinary stockholders of the company on the register at close of business on 25 February, for subscription in cash. Full particulars will be given in a circular letter to be sent to all such stockholders in the second week of March. Application will be made to the council of the Stock Exchange for permission to deal in and for quotation for the stock.

Since the end of the war the company has raised capital by two 'Rights' issues, each for 10,093,023 Ordinary shares, to Ordinary stockholders for cash and by a cash issue of £20,000,000 of 4 per cent Unsecured Loan Stock 1958/60. These issues yielded approximately £60,000,000. The net proceeds of these issues have been fully utilised in the continued expansion of the company's business, and capital for further development is now required.

The board also announce that, having received the consent of HM Treasury, they intend to submit to the Preference and Ordinary stockholders of the company at the time of the annual general meeting in June next proposals for the capitalisation of reserves and for the modification of the capital structure, whereby (i) the company's issued capital will become more realistically related to capital employed, (ii) the rate of dividend on Preference stock will be reduced from 7 to 5 per cent per annum, with a corresponding issue of additional Preference stock, and (iii) the rights attaching to the existing Preference stock will be amended so as (*inter alia*) to permit of the issue of further Preference shares ranking *pari passu* with the existing Preference stock, if at any time in the future such a course should become desirable.

At 31 December 1952 the company's capital reserves amounted to £137,251,993 and its revenue reserves to £36,440,272, making a total of £173,692,265. The present proposals will enable £80,282,240 of the company's reserves to be capitalised.

If these proposals are approved by the stockholders, £70,651,162 of the reserves capitalised will be applied in a scrip issue of one new Ordinary share of £1 fully paid for each £1 Ordinary stock held by the Ordinary stockholders. The new Ordinary shares (which will become converted into stock) will rank for all dividends declared in respect of the year 1954.

The remaining £9,631,078 of the reserves capitalised will be applied in a scrip issue at the rate of two new 5 per cent Preference shares of £1 each fully paid (which will become converted into stock) for each £5 of 7 per cent Preference stock held by the Preference stockholders, and the rate of dividend on the existing Preference stock will be reduced from 7 per cent to 5 per cent. Thus, for each £5 of existing 7 per cent Preference stock there will be £7 of 5 per cent Preference stock; the total preference dividend will accordingly remain unchanged.

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Next Week's Events

MONDAY 1 MARCH

Society of Chemical Industry

London: University College (Large Chemistry Lecture Theatre), Gower Street, 6.30 p.m. Scientific films.

Leeds: The University (Chemistry Lecture Theatre), 7 p.m. H. W. Cremer: 'The Chemical Industry & Civilisation.'

Incorporated Plant Engineers

Leeds: The University, 7.30 p.m. West & East Yorkshire branch annual general meeting.

TUESDAY 2 MARCH

Institution of Chemical Engineers

London: Geological Society's rooms, Burlington House, Piccadilly, 5.30 p.m. H. Hoog: 'The Importance of Chemical Engineering Studies in Relation to Process Development.'

Institute of Metals

Oxford: Cadena Cafe, Cornmarket Street, 7 p.m. Dr. A. R. Harding: 'Thermochemistry of Alloys.'

Swansea: University College (Metallurgy Department), Singleton Park, 6.45 p.m. T. Burchell: 'Alumino-Thermic Methods.'

Incorporated Plant Engineers

Nottingham: Victoria Station Hotel. Midlands branch annual dinner.

WEDNESDAY 3 MARCH

Royal Institute of Chemistry

West Ham: Municipal College, Romford Road, E.15, 6.30 p.m. Dr. E. I. Akeroyd: 'A Century of Ion Exchange.'

Society of Chemical Industry

Falkirk: Lea Park Rooms, Callendar Road, 7 p.m. Stirlingshire & District Section annual general meeting, followed by paper by W. H. L. Hooper: 'Recent Information on Non-ferrous Metals of Interest to the Chemical Engineer.'

Society for Analytical Chemistry

London: Royal Society's meeting room, Burlington House, Piccadilly, 4.30 p.m. Annual general meeting, followed by the Bernard Dyer Memorial Lecture, 'The Contribution of Public Analysts & Other Analytical Chemists to Public Welfare' by Dr. E. B. Hughes.

Institute of Fuel

Sheffield: The University, 6.30 p.m. Yorkshire Section meeting. Chairman's address by H. Southern.

Manchester Metallurgical Society

Manchester; Central Library (Lecture Room), 6.30 p.m. D. V. Grant: 'Surface Finishing by Liquid Honing.'

THURSDAY 4 MARCH

Chemical Society

Bristol: The University (Department of Chemistry), 7 p.m. Joint meeting with RIC, SCI and Institute of Fuel. Dr. A. Parker: 'National Fuel Resources & Their Utilisation.' (Preceded by Bristol branch annual general meeting, 6.30 p.m.).

Sheffield: The University (Chemistry Lecture Theatre), 7.30 p.m. Professor C. K. Ingold: 'Organic Reactions of Nitrous Acid.'

Society of Chemical Industry

Dundee: University College (Chemistry Department), 7 p.m. Joint meeting with CS. Dr. T. W. Goodwin: 'Recent Developments in Carotenoid Chemistry.'

Nottingham: Nottingham & District Technical College, 7.30 p.m. F. Fletcher and B. D. Thornley: 'Plasma Substitutes.'

Institute of Fuel

London: Institution of Mechanical Engineers, Storey's Gate, St. James's Park, 5.30 p.m. J. R. Jenkinson and J. R. Rylands: 'The Acid Dew-Point.'

Institute of Metals

London: 4 Grosvenor Gardens, S.W.1, 6.30 p.m. Dr. J. P. Dennison: 'High Temperature Corrosion.'

Birmingham: James Watt Memorial Institute, Great Charles Street, 6.30 p.m. Paper on 'Metals in the Oil Industry' (arranged by Shell-Mex & B.P. Ltd.).

Institute of Welding

London: Manson House, Portland Place, W1., 7 p.m. R. L. Bernhardt: 'The Welding of Copper & its Alloys.'

Leeds Metallurgical Society

Leeds: The University (Chemistry Department), 7.15 p.m. J. C. Bailey: 'Applications of Aluminium & its Alloys.'

Incorporated Plant Engineers

Peterborough: Eastern Gas Board demonstration theatre, 7.30 p.m. J. S. Skelton: 'Welding for Maintenance.'

Southampton: Polygon Hotel, 7.30 p.m. Southampton branch annual general meeting.

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FRIDAY 5 MARCH

Chemical Society

Aberdeen: Robert Gordon's Technical College, 7.30 p.m. Joint meeting with RIC and SCI. T. W. Goodwin: 'Recent Advances in Carotenoid Chemistry.'

Belfast: Queen's University (Agriculture Lecture Theatre), 7.15 p.m. Joint meeting with RIC. Professor D. M. Newitt: 'Chemical Engineering & Industrial Productivity.'

Cambridge: The University (Chemical Laboratory), 8.30 p.m. Joint meeting with University Chemical Society. Professor R. P. Linstead: 'Azoporphyrins.'

Plymouth: Technical College, 5.30 p.m. Joint meeting with RIC and SCI. Dr. C. M. Blow: 'Rubber.'

Society of Chemical Industry

Glasgow: Royal Technical College, George Street, 2.30 p.m. Joint meeting of Corrosion Group and Glasgow Section. Dr. J. C. Hudson: 'Protective Coatings for Ships & Marine Installations'; K. A. Spencer: 'Cathodic Protection of Ships & Marine Structures.' Evening session, 7.15 p.m. Dr. D. C. G. Lees: 'The Performance of Aluminium Alloys in Ships'; L. Kenworthy: 'Corrosion of Ships' Machinery.'

Manchester: Engineer's Club, Albert Square, 6 p.m. Manchester Section annual general meeting, followed by two short papers.

Institute of Fuel

Swansea: Royal Institute, Victoria Road, 6 p.m. E. H. M. Badger: 'Experiments on Coal Sampling.'

SATURDAY 6 MARCH

Incorporated Plant Engineers

London: Restaurant Frascati, Oxford Street, W.3, 6.30 p.m. London branch annual dinner and dance.

Chemical Production Limited

Development work at the Haifa plant of Fertilisers and Chemicals Ltd. is being considerably limited because of difficulties in obtaining loans and foreign investments. As a result, construction of an ammonia plant will not be completed for the time being, which will postpone the firm's plans for the production of nitrogen fertilisers. On the other hand, the newly-built sulphuric acid plant has started normal production and the company is now producing 290 tons of superphosphates daily.

Company News

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The company's audited accounts for the year 1953 are not yet available, but the information which the board already have indicates that the profits of the company for that year exceed those for 1952. The board consider that, subject to unforeseen contingencies, they will be justified in recommending at the appropriate time a final dividend for the year 1953 on the existing Ordinary stock of the company of 9 per cent (less income tax), making with the interim dividend of 6 per cent a total of 15 per cent (less income tax) for the year 1953.

Imperial Chemical Industries of Australia & New Zealand

Although total sales were less by £2,800,000, net profits of Imperial Chemical Industries of Australia and New Zealand for the year ended 30 September last rose to £1,104,373, as compared with £995,253 for the previous twelve months. The directors state that the fall in sales which began towards the end of the previous year continued until the beginning of 1953, but there has been a sustained improvement since. Import licensing, although relaxed, had substantially preserved the Australian market for local manufacturers.

English Clays Lovering Pochin & Co. Ltd.

Group trading profits of English Clays Lovering Pochin & Co. Ltd. (controlled by English China Clays, Ltd.) for the year ended 30 September last, rose from £1,315,355 for the previous twelve months to £1,633,998. Deducting directors' emoluments and pensions of £32,698 (£29,953), interest £17,891 (£14,601), tax £878,024 (£670,469), depreciation £259,763 (£231,623), etc. the net profit of £467,272 compares with £385,844. The dividend is raised from 5 per cent to 6 per cent tax free.

British Emulsifiers Ltd.

A progress report issued by British Emulsifiers Ltd. for the six months ended 31 December last states that efforts were mainly directed towards re-organising and consolidating finances and business. Financial reconstruction has been completed. Net profit was £8,334.

CLASSIFIED ADVERTISEMENTS

SITUATIONS VACANT

The engagement of persons answering these advertisements must be made through a Local Office of the Ministry of Labour or a Scheduled Employment Agency if the applicant is a man aged 18-64 inclusive, or a woman aged 18-59 inclusive, unless he or she, or the employment, is excepted from the provisions of the Notifications of Vacancies Order, 1952.

ALLIED IRONFOUNDERS, LTD., require young man having completed his National Service, for training as **ASSISTANT WORKS CHEMIST,** to be ultimately responsible for sand and grey iron control and supervision of wet process enamel mill room. Excellent prospects of advancement are offered to applicants having suitable technical qualifications. Pension Scheme. Apply, stating age and full particulars of experience, to **SECRETARY, THE COALBROOKDALE CO., LTD., KETLEY, WELLINGTON, SHROPSHIRE.**

CHEMISTS (qualified) required for Process Development Department, concerned with a wide variety of organic chemical projects.

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(2) **ASSISTANT CHEMISTS.** Industrial experience desirable but not essential. Salary in accordance with age and qualifications.

Apply, giving sufficient detail to establish a background together with salary required, to **PERSONNEL MANAGER, A. BOAKE, ROBERTS AND CO., LTD., CARPENTERS ROAD, LONDON, E.15.**

CHIEF CHEMIST required by company producing purified and chemical cellulose. Applicant must have cellulose, paper or cellulose derivative experience. This is a senior executive position and applicant should have a First or Second-Class Honours Degree and have occupied positions of responsibility in industry. Work involves responsibility for all technical functions, quality control, development and customer problems. Age 35-45 years. Salary commensurate with position. In first letter state complete record of education and positions held, plus personal data and a small photograph. Reply to **THE GENERAL MANAGER, HOLDEN VALE MANUFACTURING COMPANY, LIMITED, HASLINGDEN, LANCS.**

CHIEF PLANT ENGINEER required by company producing purified and chemical cellulose. Applicant should hold a Degree in Mechanical Engineering and have extensive experience in plant maintenance in the paper mill field. Age 35-45 years. Position is largely maintenance supervision, including steam plant, with emphasis on preventive maintenance and improving mechanical features including instrumentation. Salary commensurate with position. In first letter state complete record of education and positions held, plus personal data including a small photograph. Reply to **THE GENERAL MANAGER, HOLDEN VALE MANUFACTURING COMPANY, LIMITED, HASLINGDEN, LANCS.**

PIGMENT CHEMIST required, with experience of matching customer's samples, for experimental work on Pigment Dyestuffs and Lake Colours, and/or Chrome Yellows and Greens. Permanent position, with good salary according to age and experience. Apply, in confidence, to **THE CHIEF CHEMIST, CORNBROOK CHEMICAL CO., LTD., STOCKPORT, CHESHIRE.**

SITUATIONS VACANT

EXPERIENCED CHEMIST required by Northern Rhodesia Company situated on Copperbelt. Applicant must possess University Degree or equivalent qualification and have at least three years' experience. Basic salary will depend on experience of successful applicant, with minimum of £68 monthly, plus bonus (at present 65 per cent of basic salary), and cost-of-living allowance (at present £9 2s. per month.). Married or single accommodation available. Applications to **BOX NO. 443, WALTER SKINNER, LTD., 20, COPTHALL AVENUE, LONDON, E.C.2.**

EXPERIMENTAL OFFICERS AND ASSISTANT EXPERIMENTAL OFFICERS in various Government Departments. The Civil Service Commissioners invite applications for pensionable posts. Applications may be accepted up to 31 December, 1954, but forms should be returned as soon as possible as an earlier closing date may be announced either for the competition as a whole or in one or more subjects. Interview Boards will sit at frequent intervals.

The posts are divided between following main groups and subjects :—(*a*) Mathematical and Physical Sciences; (*b*) Chemistry and Metallurgy; (*c*) Biological Sciences; (*d*) Engineering subjects; and (*e*) Miscellaneous (including e.g., Geology, Library and Technical Information Services).

AGE LIMITS.—For Experimental Officers, at least 26 and under 31 on 31 December, 1954; for Assistant Experimental Officers at least 18 and under 28 on 31 December, 1954. Extension for regular service in H.M. Forces.

Candidates must have at least one of a number of specified qualifications. Examples are: Higher School Certificate, General Certificate of Education, Scottish Leaving Certificate, Scottish Universities Preliminary Examination, Northern Ireland Senior Certificate (all in appropriate subjects and at appropriate levels), Higher National Certificate, University Degree. Candidates taking their examinations in 1954 may be admitted. Candidates without such qualifications may be admitted exceptionally on evidence of suitable experience. In general a higher standard of qualification will be looked for in the older candidates than in the younger ones.

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Further particulars and application forms from **CIVIL SERVICE COMMISSION, SCIENTIFIC BRANCH, 30, OLD BURLINGTON STREET, LONDON, W.1,** quoting No. S94-95/54. **451/130/WP/2/54.**

THE Atomic Weapons Research Establishment, Aldermaston, has a vacancy for a **SENIOR EXPERIMENTAL OFFICER** or **EXPERIMENTAL OFFICER** for chemical engineering calculations, design and specification writing. The minimum qualifications are a Higher School Certificate (Science), or equivalent, but possession of a pass degree in Science would be an advantage. Previous experience in this type of work is desirable and applicants are normally expected to be at least 26 years of age. The salary range per annum for Senior Experimental Officer is from £928 to £1,091 and for Experimental Officer from £650 to £800. Housing accommodation will be available within a reasonable period for the successful applicant, if married. Application should be made to the **ADMINISTRATIVE OFFICER, RECRUITMENT, ATOMIC WEAPONS RESEARCH ESTABLISHMENT, ALDERMASTON, BERKSHIRE,** quoting reference 19/W.G.E.

SITUATION VACANT

SOUTH EASTERN GAS BOARD

A **CHEMICAL ENGINEER** is required for the **ORDNANCE WHARF TAR DISTILLATION WORKS** in **GREENWICH, LONDON, S.E.10.** Applicants must possess a degree in Chemical Engineering and have a preference for large-scale operations and must be able to make their own drawings. The successful applicant will be expected to help with the design and layout of new plant and the study of the performance of existing plant. The salary will be within the ranges £635-£715 per annum, or £665-£765 per annum, according to experience, qualifications and ability.

Applications, quoting reference V27/384, giving age, qualifications and details of experience, should be forwarded to the **PERSONNEL MANAGER, SOUTH EASTERN GAS BOARD, KATHARINE STREET, CROYDON, SURREY,** within fourteen days.

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